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German Destruction in Northern France

Systematic Demolition Amounting to Chaos — How Denain and Anzin Steel Plant Was Destroyed — One Problem of Reconstruction

FROM Major L. Descroix, consulting engineer, who was attached to the headquarters staff of the French Army during the War, THE IRON AGE has obtained data additional to that already published on the destruction wrought to iron and steel works, coal mines and other properties by the Germans when they invaded France or on their withdrawal from territory they occupied when the turning point of the War loomed up and they saw they must retire.

Major Descroix lays special stress on the destruction of the blast furnaces, forges and steel works of the Denain & Anzin Co., in the north of France, at Denain and Anzin. This company, pronounced by Major Descroix to be the largest producer of steel in France, having an output of 400,000 metric tons per year, was also among the chief producers of pig iron, having made 335,000 metric tons in 1913. Preliminary to describing the havoc inflicted at the Denain and Anzin plants, Major Descroix says of the German operations:

Wherever the German forces went they displayed a savage spirit of destruction. A close examination, however, reveals the fact that there is a slight difference between the destruction wrought in the north, the Pas-de-Calais and the Ardennes departments and those inflicted on the mining industries of the east and particularly of Meurthe and Moselle. Cold judgment ruled.

What Remained of a Group of Blast Furnaces at the Denain & Anzin Works When the Germans Had Finished

In the first case, the destruction was complete and thorough. It is merely a bare statement of fact to record that the whole of the mining and metal industries in these regions have been wiped out of existence. All that now remains is an indescribable mass of dynamited masonry, of tottering walls, and of twisted and scarred metal girders forming a shapeless heap on the ground.

From time to time the traveler observes a building apparently intact, but a close examination always shows that the metal work has been so weakened by fire that the whole structure is ready to fall, and that even the work of pulling down buildings has been rendered more difficult by the fact that the bases of most of the pillars have been dynamited.

In Lorraine there are a few complete buildings. As in the north of France, all of the tools and mechanical equipment has been taken away or destroyed. Some of the blast furnaces have escaped total destruction and a certain number of the mines are in a working condition. Not much has been left, but there is nevertheless a difference between the Lorraine district and the absolute chaos of the north.

Destroyed to Cripple Future Industry

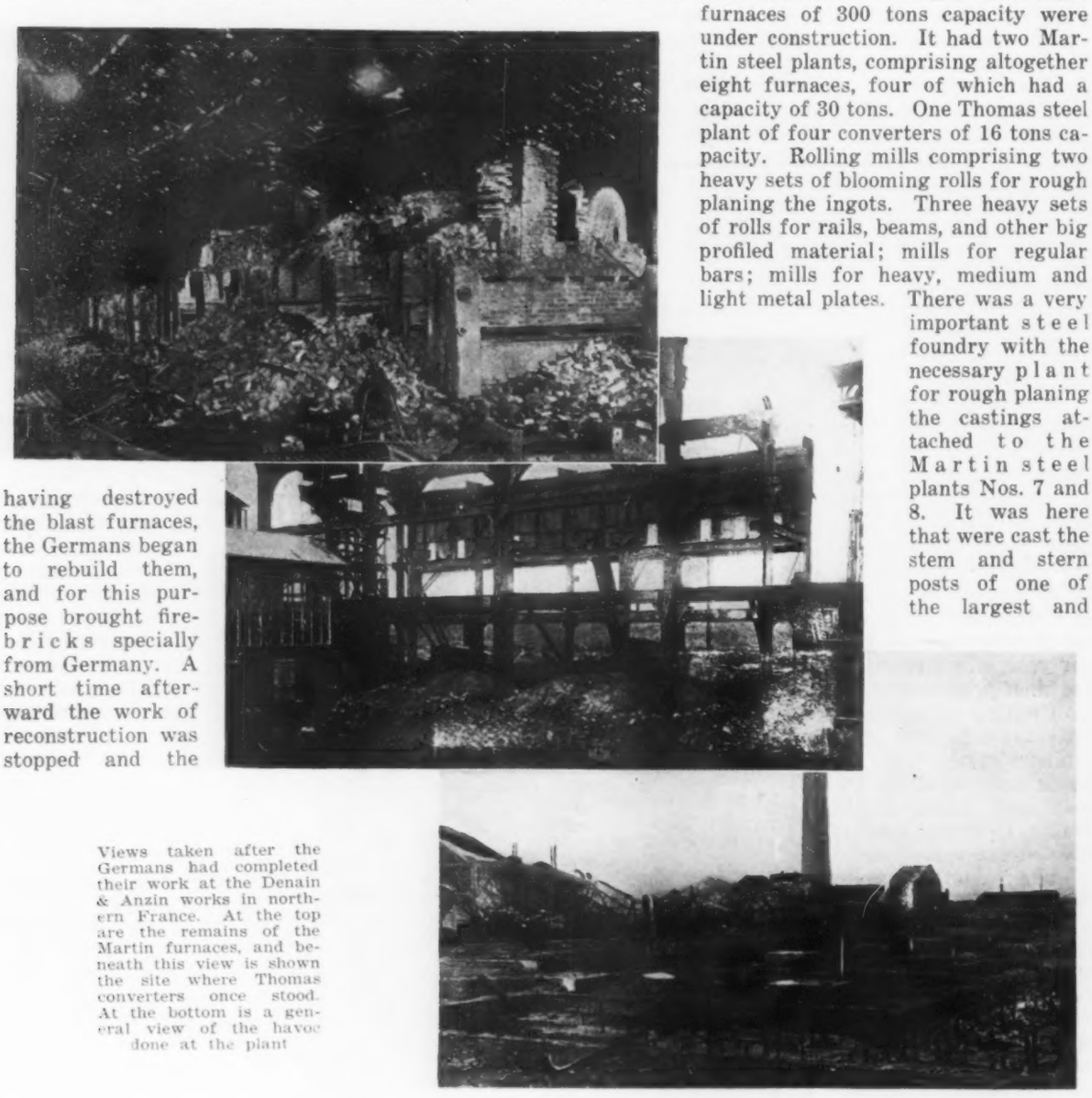
The question naturally arises, what is the reason for this slight advantage, and the answer is that the German's own interest guided him in his conduct. The industrial wealth of the north of France was looked upon as nothing more than a ransom taken from France. Germany had no particular use for the coal mines of northern France. But if she destroyed them she could strike an almost fatal blow at her enemy.

At the end of 1914, when Germany realized that her plans had miscarried, and that the ransom she held would some day or other be lost to her without compensation, she began to get out of this industry everything available. Raw material, plant, scrap metal—all were taken, for Germany was resolved that not an ounce of material she could use should be left behind.

Germany always considered that she had obtained permanent possession of the Longwy and the Briey iron mines, and in consequence she had reason for maintaining these in the best possible condition. When the Allies put their blockade into effect, Germany realized that the operation

of the Longwy and Briey mines was as important for her supply of munitions as the working of the mines in annexed Lorraine. This necessity of getting everything possible out of the Longwy and Briey iron mines has been officially recognized by the Imperial Government, the Imperial General Headquarters Staff, the Association of German Metal Manufacturers and the Association of Forges.

Therefore the Germans sought to keep the Lorraine mines in operation. They were anxious to produce some of their pig iron on the spot, and in order to do so they had spared a certain number of the blast furnaces. In certain cases, after having destroyed the blast furnaces, the Germans began to rebuild them, and for this purpose brought firebricks specially from Germany. A short time afterward the work of reconstruction was stopped and the furnaces pulled down and the firebricks sent back into Germany. It is possible that this was done owing to military events, which made the continued occupation of this ground appear doubtful, or it may be that the general situation in Germany made the use of these blast furnaces unnecessary. These incidents took place notably at Auboué, where the mines and blast furnaces belong to the Pont à Mousson Blast Furnaces & Foundry Co.



Views taken after the Germans had completed their work at the Denain & Anzin works in northern France. At the top are the remains of the Martin furnaces, and beneath this view is shown the site where Thomas converters once stood. At the bottom is a general view of the havoc done at the plant

The probable explanation is that the German people thought that they could appeal to our sense of indulgence by this localized example of moderation. Germany held important interests in French mines near the eastern frontier; she also had big holdings in the mines and factories of annexed Lorraine, the loss of which province she knew to be certain. She thought that by curbing her destructive spirit, she might save some of these interests.

How a Great Steel Plant Was Ruined

At the town of Denain, in the North Department, there existed a joint stock company known as the Société Anonyme of the blast furnaces, forges and steel works of Denain and Anzin. This company had six blast furnaces in operation; two of these had a daily output of 200 tons of pig iron, and the four others of 100 tons. Two blast furnaces of 300 tons capacity were under construction. It had two Martin steel plants, comprising altogether eight furnaces, four of which had a capacity of 30 tons. One Thomas steel plant of four converters of 16 tons capacity. Rolling mills comprising two heavy sets of blooming rolls for rough planing the ingots. Three heavy sets of rolls for rails, beams, and other big profiled material; mills for regular bars; mills for heavy, medium and light metal plates. There was a very important steel foundry with the necessary plant for rough planing the castings attached to the Martin steel plants Nos. 7 and 8. It was here that were cast the stem and stern posts of one of the largest and most recent of the cruisers of the French navy.

In addition to these shops working for the general clientelle, the Denain factory comprised a number of shops working for its own requirements and for the Anzin factory. These shops produced 1200 tons of varied castings per month; it supplied most of the refractory material required; it had mechanical departments for maintenance and repair, and 152 coke furnaces.

At Anzin, near Valenciennes, and six miles from Denain, the company had another plant which comprised two blast furnaces of 100 tons daily capacity; one Martin steel plant, quite new, which would have comprised four furnaces of 30

tons, two of which had been finished and put into operation in May, 1914; two puddling furnaces; a rolling plant comprising a series of seven rolling mills capable of producing all kinds of bars of small and medium size.

The annual production of the two factories at Denain and at Anzin was 300,000 to 350,000 tons of finished goods. The company only occasionally sold small quantities of rough or semi-finished goods. This output corresponded to 400,000 tons of pig and more than 400,000 tons of steel. The factory gave employment to 7500 workers, who, with their families, represented a population of 25,000. During the period of reconstruction these people are for the most part without means of existence, and have been obliged to leave the district to which they are attached by long residence and customs. Their life in this district had been brightened and made more agreeable by the building of garden cities. The Denain & Anzin Co. had done everything possible to increase the number of these garden cities and had also erected infant, primary and domestic economy schools, as well as hospitals, meeting halls, etc.

These big plants consumed annually more than 340,000 tons of coal, 380,000 tons of coke, and 950,000 tons of iron ore, in addition to much subsidiary material for maintenance and repair. For the Denain factory alone there were in service at the special railroad station more than 1000 freight cars per day.

The Denain & Anzin Co. possessed a considerable quantity of rolling stock. In addition to the narrow gage locomotives and cars, there were 37 broad gage locomotives, 900 cars, of which 137 had a capacity of 20 tons and 157 a capacity of 40 tons. Of this total there now remain 16 cars of 40 tons capacity which happened to be at the Normandy mines, and two cars of 49 tons capacity which were recently found in Meurthe and Moselle, in addition to about 50 cars and four locomotives which have been recovered from Germany since the armistice.

The accompanying photographs show what has happened to this magnificent industrial plant.

One of the most painful details of the systematic destruction was that the work was carried out from the beginning of 1916 by Russian, English and French prisoners of war.

Equipment Shipped to Germany

Practically the whole of the blast furnaces, the steel works and the rolling mills has been destroyed and broken up. A certain number of machines and of appliances have been taken down and sent into Germany to be erected there. Among these is a steam engine of 5000 hp. used for driving the rolling mills, turbine-generators, etc.

More views of the ruins of the Denain & Anzin works. In top picture is shown what remains of the electric generating station. In the middle view is the site of the wrecked rolling mills and at the bottom is a general view of the mill building

The new equipment of the Martin steel plant at Anzin evidently looked good to Captain Böcking, of the German cavalry. This officer, a metallurgist in peace times, had the entire plant sent to his own works at Mulheim-on-the-Rhein.

The Union Co., Dortmund, Germany, secured possession of the plate and sheet mill, the site of which is shown in one of the illustrations. It was intended that this plant should begin production in the fall of 1914. It had been fitted up for the production of 50,000 tons of heavy plates per year. The mills were the biggest of their kind in Europe, and were to be capable of producing plates up to 1.1 in. in thickness and 168 in. in width. With all its auxiliaries, comprising a stamping press, a motor of 10,000 hp., electrical and hydraulic appliances, it covered an area of 7½ acres. Of this

TABLE I.—METAL-WORKING INDUSTRIES IN THE INVADED REGION OF NORTHERN FRANCE

(Departments of the Nord and Pas-de-Calais)

			Annual production, tons pig iron
(A) *Blast Furnaces—*			
1. Blast furnaces, forges and steel works of Denain & Anzin (Nord)	8	blast furnaces, coal mines, forges, steel works, rolling mills, foundries	335,000
2. Forges and steel works of the north and the east at Trith-Saint-Leger and Valenciennes	5	blast furnaces, foundries, forges, steel works, rolling mills	*181,000
3. Esperance works, at Louvroil (Nord)	4	blast furnaces, steel works, forges, rolling mills	143,000

*Estimated.

The above represents 12.4 per cent of the total French production.

		Capital
(B) *Steel Works, Forges, Rolling Mills, Foundries—*		
4. Arbel Co. (Douai Forges) at Douai (Nord)	Steel works (4 Martin furnaces), forges, foundries, rolling mills	$1,200,000
5. Baume & Marpent, at Marpent (Nord)	Steel works, forges, foundries, mechanical shops	700,000
6. Foundries and rolling mills of Biache-St. Vaast (Pas-de-Calais)	Rolled metals (22,000 tons per year)	400,000
7. J. Brixy, at Somain (Nord)	Forges	.....
8. M. Dembiermont & Co., at Hautmont (Nord)	Forges	.....
9. Blast furnaces of Denain & Anzin	Steel works, 400,000 tons per year (see blast furnaces)	2,400,000
10. Domange Brothers, at Denain (Nord)	Steel works (2 Martin furnaces), steel foundry, 1700 tons per year	.....
11. A. Descamps, at Raismes (Nord)	Bolt works, 4000 tons per year	.....
12. Doremieux Sons & Co., at Saint-Amand (Nord)	Steel works, 5 puddling furnaces, forges, rolling mills, 12,000 tons per year	.....
13. Forges of Entre Deux Bois, at Hautmont (Nord)	Forges, bolt works	40,000
14. Escault & Meuse Co., at Anzin (Nord)	Martin steel works, 62,000 tons per year; rolling mills, sheet metal and tubes, 89,000 tons per year; foundry, 1200 tons	1,000,000
15. Esperance Works, at Louvroil (Nord)	Thomas steel plant (3 converters), 12 puddling furnaces, rolling mills, forges	1,200,000
16. Metal Works of Ferrière la Grande, at Ferrière-la-Grande (Nord)	Rolling mills, 20,000 tons per year	145,000
17. Gehu Brothers, at Hautmont (Nord)	Forges	.....
18. Steel Works and Art Foundry of Haine-St.-Pierre, at Lesquin-lez-Lille (Nord)	Steel foundry and steel works	.....
19. Hautmont Rolling Mills and Tube Works, at Hautmont (Nord)	Forges, rolling mills	85,000
20. Hautmont Bolt and Iron Works, at Hautmont (Nord)	Bolts, forges, 6000 tons per year	.....
21. Hermant Hicguet Factory and Bolt Works, at Hautmont (Nord)	Bolts, forges	.....
22. A. Housez & Co., at Vieux-Condé (Nord)	Stampings and forgings	.....
23. Phenix Co., at Rousies (Nord)	Forges, iron work	18,000
24. Leval-Aulnoye Forges, at Aulnoye (Nord)	Rolling mills	220,000
25. Louvroil Metal Works, at Louvroil (Nord)	Thomas steel plant (3 Martin furnaces), rolling mills	.....
26. Forges and steel works of the Marine & Homecourt, at Hautmont (Nord)	Forges and rolling mills (the main works are in the center and east, invaded)	14,000,000
27. Martin, Maitte & Huberland, at Pont-sur-Sambre (Nord)	Forges	.....
28. Maubgeuge Iron Works, at Louvroil (Nord)	Steel works, 3 Martin furnaces and 12 puddling furnaces, rolling mills, forges	300 000
29. Milourd Forges, at Milourd (Nord)	Alloy steels, tools	88,000
30. Metallurgical Co. of Montbard-Aulnoye, at Aulnoye (Nord)	Steel works, forges, foundries	1,600,000
31. Northern Steel Works, at Hautmont (Nord)	Steel works (3 converters), 1 Martin furnace	400,000
32. Forges and steel works of the north and east, at Trith-St.-Leger and Valenciennes	(See blast furnaces), steel works, forges, foundries, rolling mills	3,000,000
33. Louis Piret & Co., at Jeumont (Nord)	Rolling mills	.....
34. Metallurgical Society of Pont à Vendin, Lens (Nord)	Blast furnaces and steel works, built in 1914	5,000,000
35. The Providence blast furnaces, forges and foundries, at Hautmont (Nord)	Martin steel plant, rolling mills, foundries	3,600,000
36. Recquignies Forges, at Recquignies (Nord)	Forges, rolling mills, tubes	660,000
37. St. Amand Forges and Rolling Mills, at St. Amand (Nord)	Rolling mills	200,000
38. Sambre Blast Furnaces and Rolling Mills, at Hautmont (Nord)	Steel works, 3 Martin furnaces, 6 puddling furnaces, rolling mills, 60,000 tons per year	480,000
39. Sambre and Meuse Steel Works, at Jeumont (Nord) and at Stenay (Nord)	Steel works, 6 converters, 1 Martin furnace, steel foundry; 15,000 tons per year	800,000
40. Henin-Lietard-Romain Sartiaux & Sons Steel Works, at Henin Lietard (Pas-de-Calais	Martin steel plant, steel foundry; mining material; 5400 tons per year	540,000
41. Senelle-Maubeuge Metallurgical Co., at Sous-les-Bois (Nord)	Foundry, steel works, rolling mills, mechanical construction (See Tables II and III)	3,200,000
42. Tube Works, at Solesmes (Nord)	Iron and steel tubes	240,000
43. French Society for the Production of Tubes, at Louvroil (Nord)	Martin steel plant, tube works; 18,000 tons per year	800,000
44. Tube Co. of Valenciennes et Denain, at Valenciennes (Nord)	Tube works, 10,000 tons per year	700,000
(C) *Mechanical Construction and Steel Girders—*		
45. Baudon & Co., at Ronchin-lez-Lille (Nord)	Steel girders, foundry	.....
46. French Co. of Mechanical Construction (formerly Cail), at Denain (Nord)	Locomotives, sugar plant machines, general engineering	3,600,000
47. Decauville Co., at Petite-Synthe (Nord)	Locomotives, rolling stock	1,000,000
48. Ed. Delattre & Co., at Ferrière-la-Grande (Nord)	General engineering, construction of rolling mills, steam boilers	.....
49. Dujardin & Sons, at Lille (Nord)	Steam engines	.....
50. Fives-Lille Co., at Fives-Lille (Nord)	Boiler work, locomotives, general engineering, electrical material	3,000,000
51. Franco-Belge Railroad Material Co., at Raismes (Nord)	Locomotives, 80 per year; wagons, 2500 per year	2,000 000
52. Hautmont Engineering, Forge & Foundry Co., at Hautmont (Nord)	Steel girders, 5800 tons per year	200,000
53. Metallurgical Co. of Hautmont (Nord)	Steel girders, railroad material	.....
54. Malissard-Taza Forges and Engineering Works, at Anzin (Nord) and at Beuvrages	Rolling stock for mines and railroads: 1200 wagons and 8000 small wagons per year	185,300
55. French Railroad Material Co., at Maubeuge	Metal girders, rolling stock, sheet metal work	720,000
56. Maubeuge Metal Working Co., at Douzies-Maubeuge (Nord)	Metal girders, factory material	320,000
57. L'Abeille, Sculfort & Fockedey Co., at Maubeuge (Nord)	Machine tools	.....
58. French Metallurgical and Engineering Co., at Ferrière-la-Grande (Nord)	Aluminum rolling mills	50,000
59. North of France Engineering Co., at Blanc-Misseron (Nord)	Rolling stock	2,200,000
60. G. Ramez, Dumez & Co., at Hautmon (Nord)	Steel girders, railroad material	.....
61. Venot & Co., at Onnaing (Nord)	General engineering, foundry, boiler work	90,000
62. Ch. Vermot, Valere, Mabille & R. Pelgrins Co., at Douzies (Nord)	Rolling stock, iron and brass foundry	1,600,000
63. Vautier & Co., at Maubeuge (Nord)	Machine tools	.....

plant there now remains nothing more than the stone foundations which have been carefully destroyed by dynamite.

It will be noticed from the illustrations that the buildings in which the rolling mills once stood still remain. It would be a mistake to suppose, however, that these are still capable of being used. In order to round off their work of destruction, the Germans set fire to large quantities of wood which the pioneers had stored in these buildings. These fires were started on October 20, 1918, and lasted three days. All the metal girders have been eaten by the flames to such an extent that the whole of the buildings are ready to fall.

In addition to these two plants, the Denain & Anzin Co. had a coal plant at Agincourt, to the south of Aniche. This had been purchased a short time before the war and had been extended, new borings had been made and by-product coke ovens had been erected. All were destroyed by the Germans. The iron mines near Longwy, in which the company had important holdings, were sacked. The company also lost its two ships which were used for bringing ore from Spain.

Of its original possessions the Denain & Anzin Co. now holds its iron mines located at La Ferrière-aux Etangs, in Normandy, its share in the iron mines of Bilbao, in Spain, and the ruins of its mills.

At the present time, it is impossible to give an exact evaluation of the loss suffered by the company, but it is more than probable that, based on 1914 values, the total is more than $20,000,000, and may run to $26,000,000.

TABLE II.—THE ARDENNES METAL INDUSTRIES
(This department was completely occupied by the enemy)

		Annual production / Capital
(A) *Blast Furnaces—*		
1. Gorcy Metallurgical Co., at Vieux-Molhain	1 blast furnace	tons 14,000
(B) *Steel Works, Forges, Rolling Mills, Foundries—*		Capital
2. Auberives Metallurgical Co., at Auberives	Tube foundry and heavy parts (5 cupolas)	$1,800,000
3. Bidez & Haller Co., at Fumay	Foundries	110,000
4. Blagny-Carignan Forges, at Blagny and at Carignan	Sheet metal rolling mills, 8500 tons per year	200,000
5. Bogny-Braux Bolt Works, at Chateau Regnault-Bogny, Bogny, Braux, Levrezy, Flize	Bolt works and forges, 10,000 tons per year; rolling mills 32,000 tons per year	1,100,000
6. Brevilly Forges, at Brevilly (Ardennes)	Martin steel works, forge, nail factory	300,000
7. Leopold Barrachin, at Signy-le-Petit	Foundry; stoves	.....
8. Lefort & Co., at Mohon, St. Marceau, Charleville, Monterme, etc.	Martin steel plant, forges, rolling mills, nail plant, saw mill	600,000
9. Ch. Liegois, at Givonne	Heavy tools	.....
10. Margut Foundries and Steel Works	Steel works (4 cupolas), 1 Martin furnace, malleable and bronze castings	240,000
11. French Metal Co., at Givet	Rolling mills for all metals	5,000,000
12. Morel Forges and Foundries of St. Nicholas, at St. Nicolas	Forges, foundries, rolling mills, stoves	.....
13. Sedan Forges, at Sedan	Forges, rolling mills	160,000
14. Metallurgical Society of Senelle-Maubeuge, at Laval-Dieu	Rolling mills, foundry (See Table I)	3,200,000
15. Vireux Molhain Forges, at Vireux Molhaix	Martin and Thomas steel plants, forges, rolling mills; iron foundry, 4000 tons; finished goods, 91,000 tons per year	800,000

In common with many French concerns, it was the practice of the Denain & Anzin Co. to set aside an important proportion of its profits for extensions and improvements, in order not to have to apply to outside sources for new capital. This careful method of operating made the French companies decidedly richer than would appear from their registered capital. This company, for instance, had a capital of only $2,400,000. Each year the company set aside from profits from $3,000,000 to $3,200,000 for extensions and improvements. By reason of this policy, the factories had progressively grown from the year 1835. This naturally leads to another of the problems regarding reconstruction.

TABLE III.—METAL INDUSTRIES IN THE INVADED DISTRICTS OF EASTERN FRANCE (LORRAINE)

	PRODUCTION OF PIG IRON	Production of Pig Iron Per day, tons	Per year, (1913) tons
Longwy Basin—			
1. Gorcy Metallurgical Society at Gorcy	2 blast furnaces, forges, steel works, rolling mills	120	*36,000
2. French Metallurgical Society, at Gorcy	Foundries	....	.....
3. Longwy Steel Co. Works, at Mont St. Martin	7 blast furnaces, 2 steel plants, rolling mills, foundries	1200	365,000
4. Chiers Blast Furnaces Co., at Longwy	4 bast furnaces	350	81,000
	Steel works, rolling mills, 70,000 tons of steel per year.		
5. F. de Saintignon, at Longwy and Gouraincourt	4 blast furnaces	550	173,000
6. Providence Forge Co., at Rehon	3 blast furnaces, steel works, rolling mills	....	.....
7. Senelle-Maubeuge Metallurgical Co. at Senelle-Longwy and at Villerupt	5 blast furnaces	750	*280,000
	2 steel works, rolling mills, 2 blast furnaces	200	.....
8. Marc Raty & Co., at Saulnes	Mines; 4 blast furnaces	350	95,000
9. Lorraine Industrial Co., at Hussigny	2 blast furnaces	200	51,700
10. Auberives and Villerupt Co., at Villerupt	Mines; 2 blast furnaces, foundries	190	70,000
11. Micheville Steel Works, at Micheville-Villerupt	Mines, 6 blast furnaces, steel works, rolling mills	1100	390,000
Briey Basin—			
12. Company of the Marine and Homecourt, at Homecourt	Mines, 7 blast furnaces, steel works, rolling mills	1300	376,000
13. De Wendel & Co., at Joeuf	Mines, 8 bast furnaces, steel works, rolling mills	1200	394,000
14. Pont à Mousson Co., at Auboue	Mines, 3 blast furnaces	500 to 600	285,000
Nancy Basin—			
15. Pont à Mousson Co., at Pont à Mousson	5 blast furnaces, pipe foundry, 200,000 tons of pipe lines	....	
	Approximate total	(tons)	2,797,000
	Representing 52.8 per cent of total French production.		

*Figures having asterisk are estimated production and are not guaranteed exact.

In place of all these establishments which have grown year after year, it is obvious that it will be necessary to build entirely new and modern works, laid out on modern lines. This is a point of view which will be readily understood in America; but unfortunately this is not always clearly seen in

France. The law on war damages provides for an indemnity to cover the restoration of factories which have existed, and not at all for the construction of factories on new plans. Applying this principle with more zeal than intelligence, the inspectors carefully and slowly calculate the value of every bit of wall which may have been left standing, even though it may be necessary to pull that wall down before the work of reconstruction can commence. This value is deducted from the amount to be paid to the manufacturer as compensation for the damage he has suffered.

This false point of view operates detrimentally towards manufacturers by raising difficulties and delaying the work of reconstruction to the disadvantage of the entire nation. The Government officials do not pay any attention to the necessities of progress. They ignore the losses due to the fact that during a period of ten years—from 1914 to 1924—these factories could have set aside every year more than $3,000,000 for improvements on the plant as it existed at Denain and at Anzin in 1914. In other words, when, in 1924, the Denain & Anzin factories are rebuilt the company will have got back its plant as it existed in 1914, and not as it would have existed in 1924 if the war had not intervened. And during that time Germany will have continued production with plants which have been unaffected by the war.

The accompanying tables, setting forth the metal working industries in the invaded districts of France are supplied by Major Descroix.

SELLING THE SURPLUS

How Manufacturing Plants and Equipment Will Be Disposed Of

WASHINGTON, July 8.—Arrangements have been completed by the United States Shipping Board and Emergency Fleet Corporation to dispose of their surplus materials and equipment. Included in the huge stocks which will be offered for sale are complete manufacturing plants, entire shipyards, drydocks, completed and uncompleted ships and all sorts of materials of iron, steel and wood, down to scrap metal.

Sales are to be consummated either by open bidding on advertised items or from price lists made up after careful study of existing market conditions and approved by the Sales Review Board. Industries which may be especially interested in the sales are chiefly the shipbuilding, steel, railroad, structural and general manufacturing concerns.

Upon the sales lists are numerous allotments of machinery, equipment and supplies, machine tools and fixtures, electrical machinery, boiler and forge shop equipment, marine equipment and accessories, air compressor equipment, contractors' equipment and supplies, bridge and gantry cranes, steel plates, shapes and bars, pumping machinery, scrap metals, lumber, deck equipment, galley equipment, marine railways, housing and transportation projects, hospital and commissary supplies, etc.

The American Steel Export Co., 233 Broadway, New York, after competition, has been awarded the contract to handle all foreign sales until Sept. 1.

It is the purpose of the Shipping Board to sell to the market and not to break the market. The officials in charge will co-operate closely with other Governmental agencies including the Director of Sales of the War Department, and with the Chamber of Commerce of the United States in ascertaining market conditions. Wherever it appears that the unloading of a large quantity of any particular product will unduly disturb the regular trade channels or react unfairly upon particular industries, steps will be taken to limit sales and to distribute them over such periods as will most satisfactorily permit of absorption of the surplus stocks and material on hand without embarrassment to any interest concerned.

No open sale, where the original cost of the items covering one transaction exceeds $5,000 will be final until approved by the Sales Review Board of the Emergency Fleet Corporation. Where a sale is made at prices not lower than the minimum prices established by the Sales Review Board, such approval will not be necessary. First opportunity for purchase will be given to the other Government departments which may have use for them.

It is planned to advertise the sales widely in the daily newspapers of the country. Firms and companies that are considered possible buyers will be circularized direct. Upon request, names will be placed on the mailing list that is being made up.

Salvage or used material will be sold subject to deterioration and subject to inspection by the buyer. Surplus or unused material will be sold carrying the original manufacturer's guarantee and the double United States inspection required before acceptance.

All sales will be made for cash on delivery, unless they are of such nature that guarantee or payment can be secured by mortgage or unless the conditions affecting the sales are such as to make it advisable to extend short time credit in cases where loss to the corporation through failure to make a sale might be greater than the risk involved in the credit transaction.

General information on sales activities can be obtained from the Supply and Sales Division main office at Philadelphia, or from branch offices at New York, New Orleans, Chicago and Portland, Ore. Sub-offices and warehouses are to be established at Boston, Jacksonville, San Francisco and Seattle. Completed ships will be sold by the Shipping Board at Washington. Partially completed ships by the secretary's office of the Emergency Fleet Corporation at Philadelphia; completed shipyards, complete drydocks and marine railways and complete manufacturing plants by the Shipyards Plant Division at Philadelphia; and housing and transportation projects by the Transportation and Housing Division at Philadelphia.

Sales of surplus supplies were reported to the Director of Sales of the War Department, totaling $33,679,000 during the week ended June 20. This may be compared with $11,535,000 for the previous week and $9,250,000 for the week before that.

Hearing on Manganese, Tungsten and Other Claims at St. Louis

ST. LOUIS, July 7—The War Mineral Relief Commission appointed by Secretary of the Interior Lane to adjust war contract claims in the mineral industries held a number of sessions in the Federal Building at St. Louis recently and then departed for Little Rock, Ark., enroute to the Pacific Coast.

At the local hearings the claims of Victor Rakowsky, a zinc operator of Joplin, Mo., the Ozark Manganese Co., P. M. Bilharz, M. E. Johnson of Muskogee, Okla., the Manganese Development & Mining Co. and the Kelsey Mines Co. were heard. Most of the claimants pointed out that special machinery was installed, plants were altered and other expense was entailed in order to speed up production on Government contracts which later were cancelled in whole or in part.

The hearings of this commission are being held in accordance with the bill passed in Congress on March 2, last, for the relief of firms holding war contracts which claim to have lost money through the cancellation of the contracts and the consequent drop in market prices. Section 5 of the bill appropriated $8,500,000 for the relief of manufacturers and producers of manganese, chrome, pyrites, and tungsten. Up to June 2 claims for $18,000,000 had been filed by mineral producers and manufacturers.

The business of the Gauld Co., Portland, Ore., has been taken over by the Gauld Supply Co., Inc., under the laws of Maine. The directors of the new company are Wm. P. F. Ayer, president; Thomas Nickerson, vice-president; G. A. Ricker, treasurer; Theo. W. Little and Carl T. Teller, all of whom are prominently connected with the Walworth Mfg. Co.

How the Inland Steel Co. Met War Demand

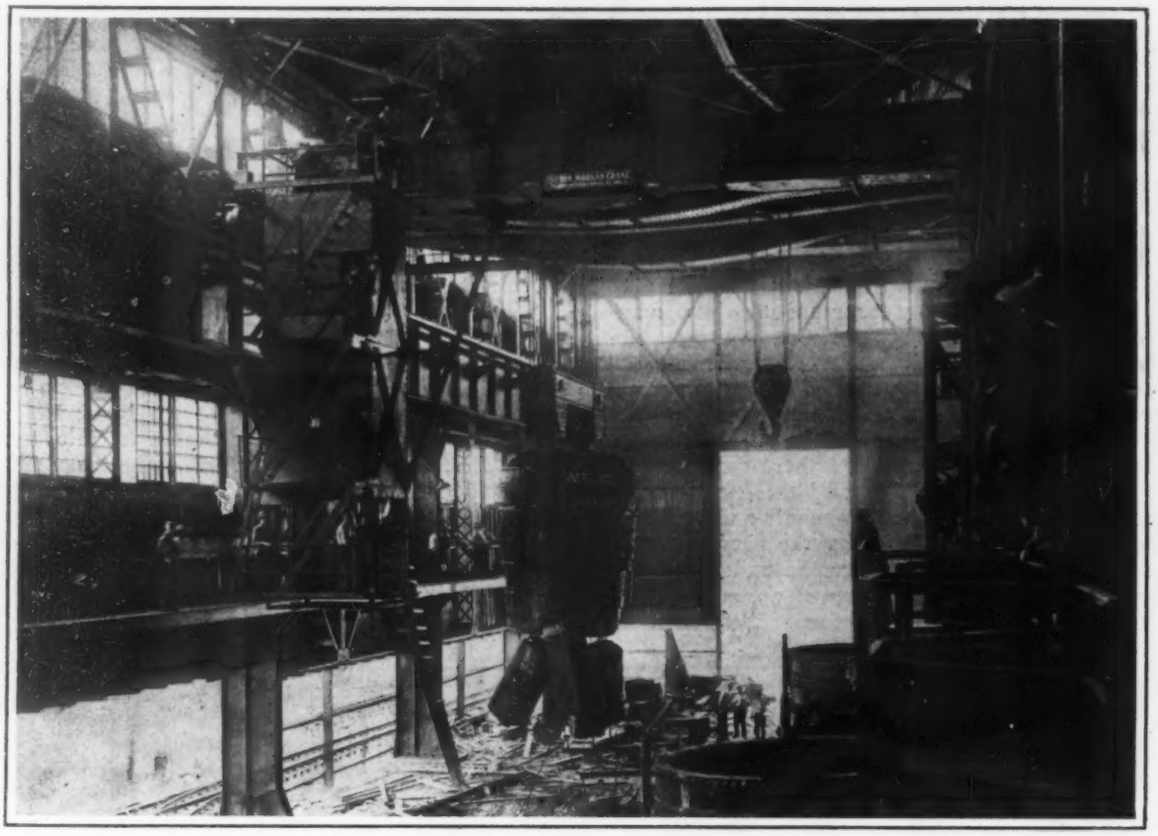
Complete New Steel Plant Containing Ten Open-Hearth Furnaces, 600-Ton Mixer and 28, 32 and 40-in. Rolling Mills Erected While War Was On

IN the summer of 1915, when it was seen that the European Allied Governments would have to look to this country for munitions, the management of the Inland Steel Co., Chicago, decided to enlarge its Indiana Harbor works to assist in meeting the forecasted demand. How extensively and expeditiously the work was done, the result being the creation, partly on ground reclaimed from Lake Michigan, is here outlined. In the annual review numbers of THE IRON AGE in the past four years the improvements and additions completed and contemplated by the company have been mentioned, but heretofore the undertaking in its entirety has not been summed up, or anything like an adequate description given. With so much to command attention only brief mention can be given to various features, even at this time. A second installment of this article, dealing with the rolling equipment, motor room and turbine station and miscellaneous features of the plant will appear in the next issue of THE IRON AGE.

When the expansion was inaugurated, the Inland Indiana Harbor works was divided into two plants, the old, or Plant No. 1, containing open-hearth furnaces, mills and shops, and the newer one, or Plant No. 2, separated from Plant No. 1 by the New York Central, Baltimore & Ohio, and the E. J. & E. railroads, containing the blast furnaces and coke plant. Private communication between the two plants was through two tunnels—one a single and one a double track. The single-track tunnel, arranged for either standard broad gage or narrow gage equipment was seldom used except for the transmission of narrow gage equipment between the two plants. The double-track tunnel was, and is, used principally in transferring molten iron from the blast furnaces to the open-hearth furnaces in Plant No. 1.

Upper View—Looking Through Billet Yard, a Hydraulic Dredge Being at Work in the Background. Much filling was done, some of the sand being pumped from Lake Michigan and some being brought in cars from a distant point.

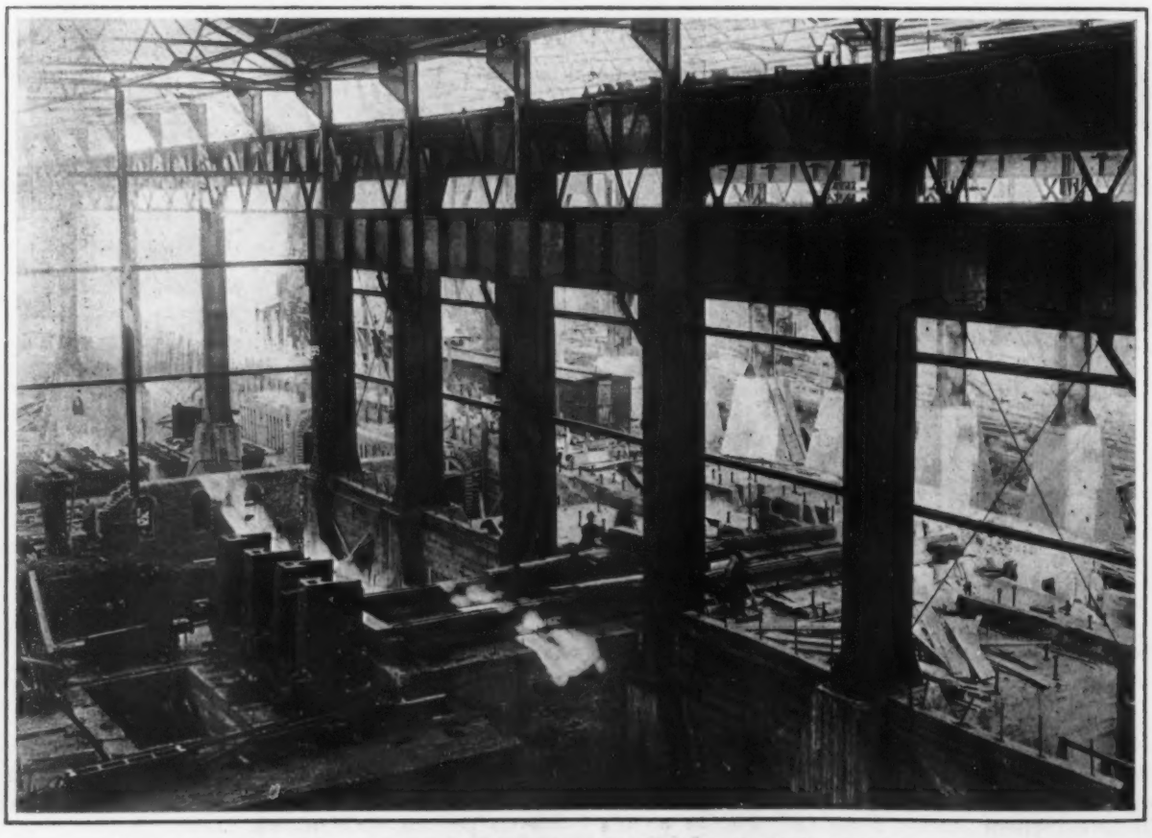
Lower—Bird's-eye View Taken in September, 1916, Showing Progress on Mill Buildings and Men at Work on Gas Producer Plant.



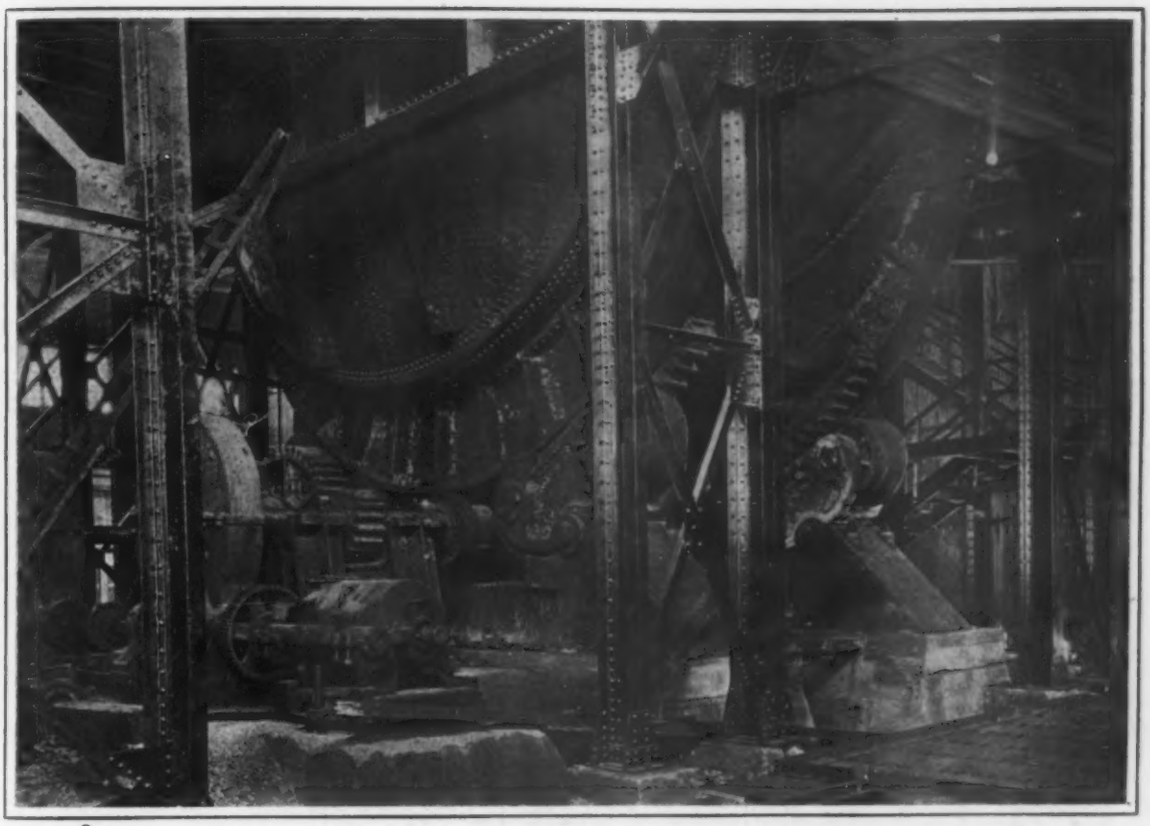
The 150-ton Open-Hearth Crane Lifting a Test Load of 200 Tons. The view gives an idea of the substantial construction which characterizes the entire new plant of the Inland Steel Co.

The acreage of Plant No. 1, which is bounded on the south by the Pennsylvania Railroad, on the west by the East Chicago canal, on the north by the New York Central, and on the east by the Indiana Harbor section of the New York Central system, is approximately 45 acres.

Plant No. 2, which is bounded on the south by the E. J. & E. Railroad, on the west by the East Chicago canal, on the north by Lake Michigan, and on the east by Lake Michigan, has 240 acres of actual and future land within its boundaries. When the improvements were started in 1915, there were



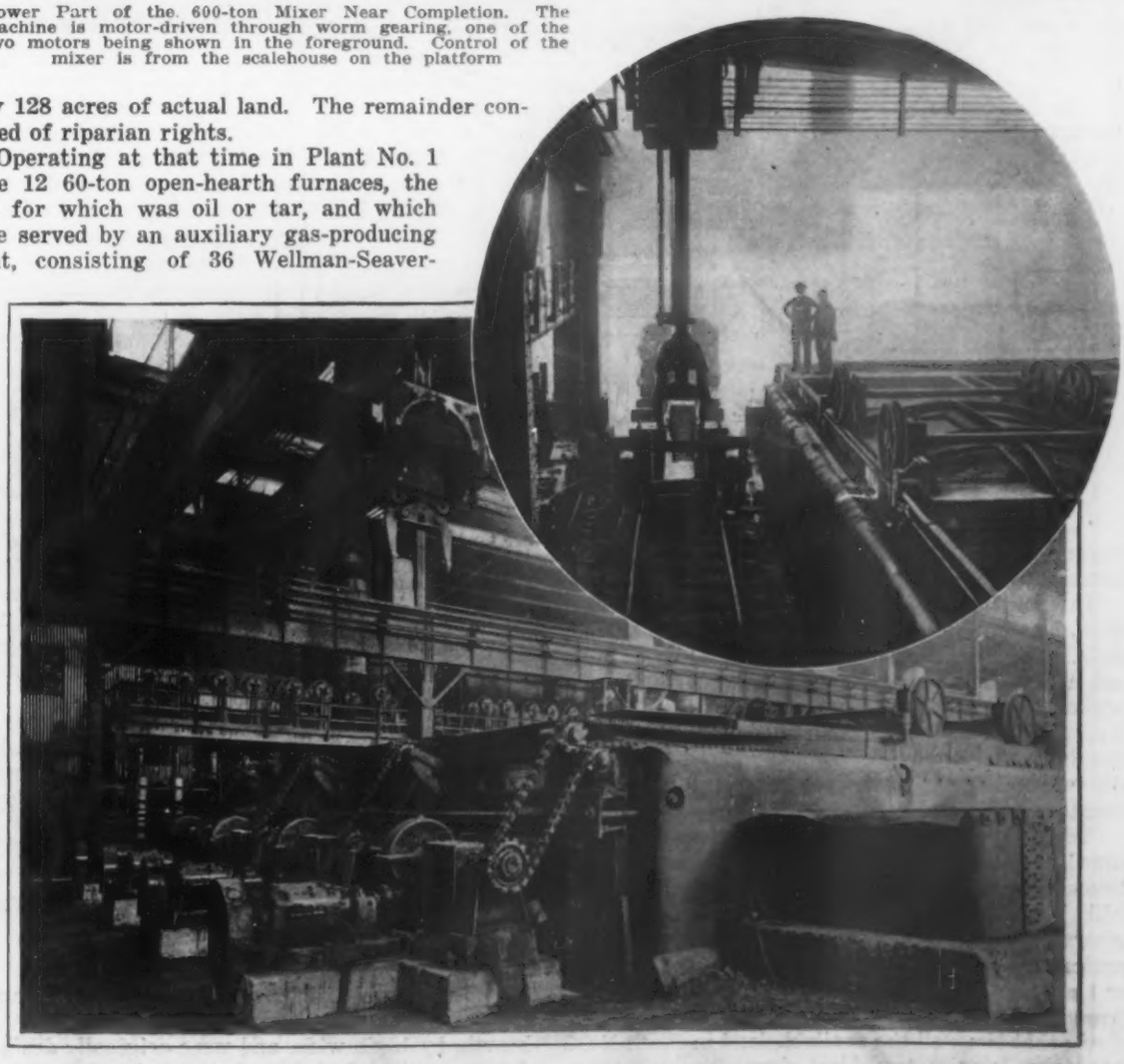
A Progress Photograph, Showing Men Setting Housing Shoes for the 32-In. Mill of the Inland Plant



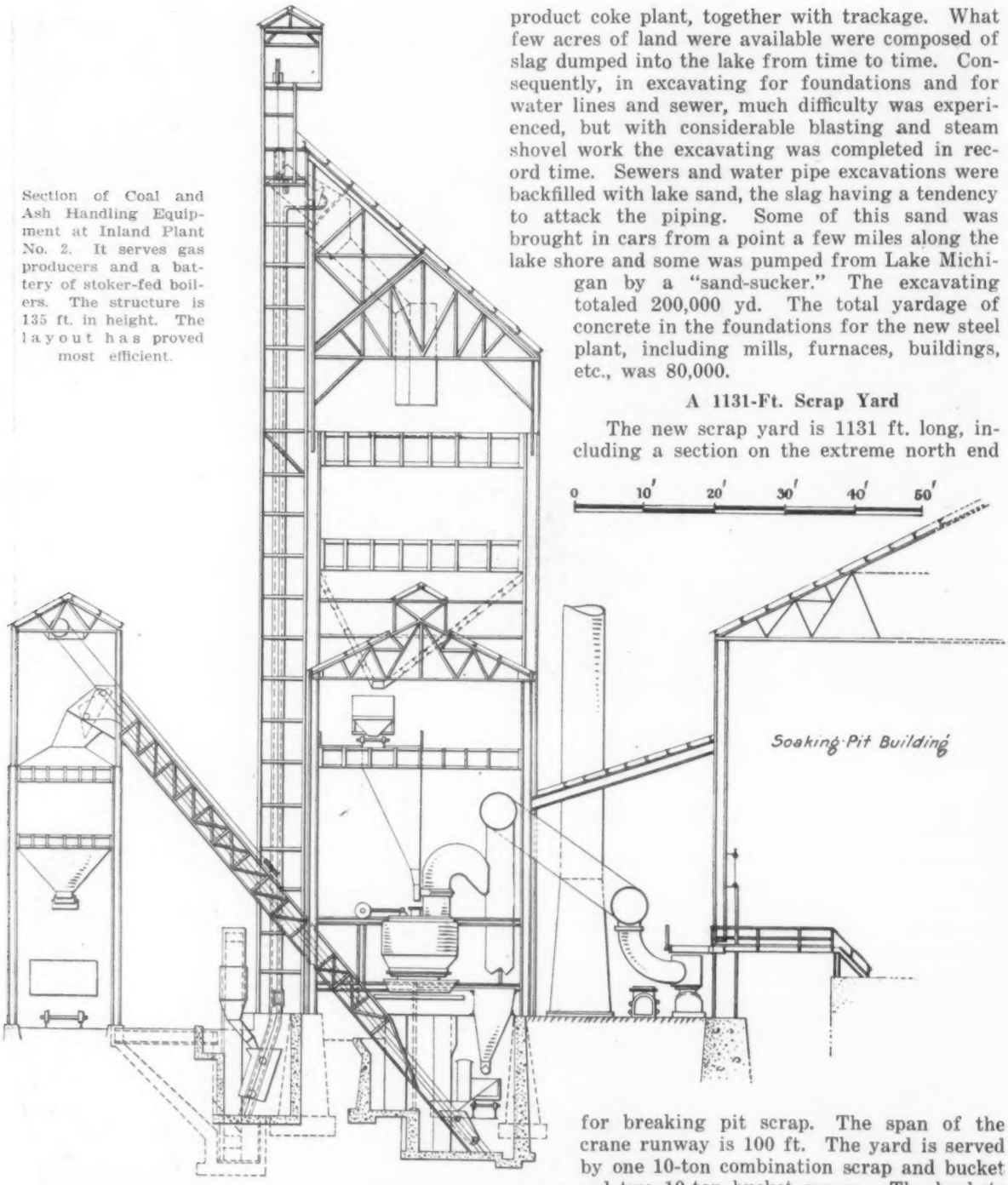
Lower Part of the 600-ton Mixer Near Completion. The machine is motor-driven through worm gearing, one of the two motors being shown in the foreground. Control of the mixer is from the scalehouse on the platform

only 128 acres of actual land. The remainder consisted of riparian rights.

Operating at that time in Plant No. 1 were 12 60-ton open-hearth furnaces, the fuel for which was oil or tar, and which were served by an auxiliary gas-producing plant, consisting of 36 Wellman-Seaver-



Motor-Driven Mechanism for Operating the Soaking-Pit Covers Through Worm Gearing, Chains and Wire Rope. In circle is shown top of pits



Section of Coal and Ash Handling Equipment at Inland Plant No. 2. It serves gas producers and a battery of stoker-fed boilers. The structure is 135 ft. in height. The layout has proved most efficient.

Morgan producers, capacity of each, 2000 lb. of bituminous coal per hour.

In operation in Plant No. 1 at that time were a 36-in. blooming mill, 24-in. billet and sheet bar mill, 24-in. bar mill, 90-in. plate mill, several sheet mills and a merchant or continuous mill. With the exception of a few feet at the ends of the mill buildings, Plant No. 1 was well filled up and in contemplating additions the company faced the necessity of building a new, isolated plant containing furnaces, mills and accessories.

To the equipment operated at that time has been added ten 90-ton open-hearth furnaces, a 40-in. blooming mill, 20 soaking pits, a 28-in. mill, a 32-in. mill, blast furnace, pumping station, scrap yard, laboratory, gas producers, coal and ash handling equipment, additional coke ovens, a machine shop, and all else that goes with these, including many large mill buildings and a fireproof storage building.

At that time, all the available land in Plant No. 2 was taken up by two blast furnaces, and a by-product coke plant, together with trackage. What few acres of land were available were composed of slag dumped into the lake from time to time. Consequently, in excavating for foundations and for water lines and sewer, much difficulty was experienced, but with considerable blasting and steam shovel work the excavating was completed in record time. Sewers and water pipe excavations were backfilled with lake sand, the slag having a tendency to attack the piping. Some of this sand was brought in cars from a point a few miles along the lake shore and some was pumped from Lake Michigan by a "sand-sucker." The excavating totaled 200,000 yd. The total yardage of concrete in the foundations for the new steel plant, including mills, furnaces, buildings, etc., was 80,000.

A 1131-Ft. Scrap Yard

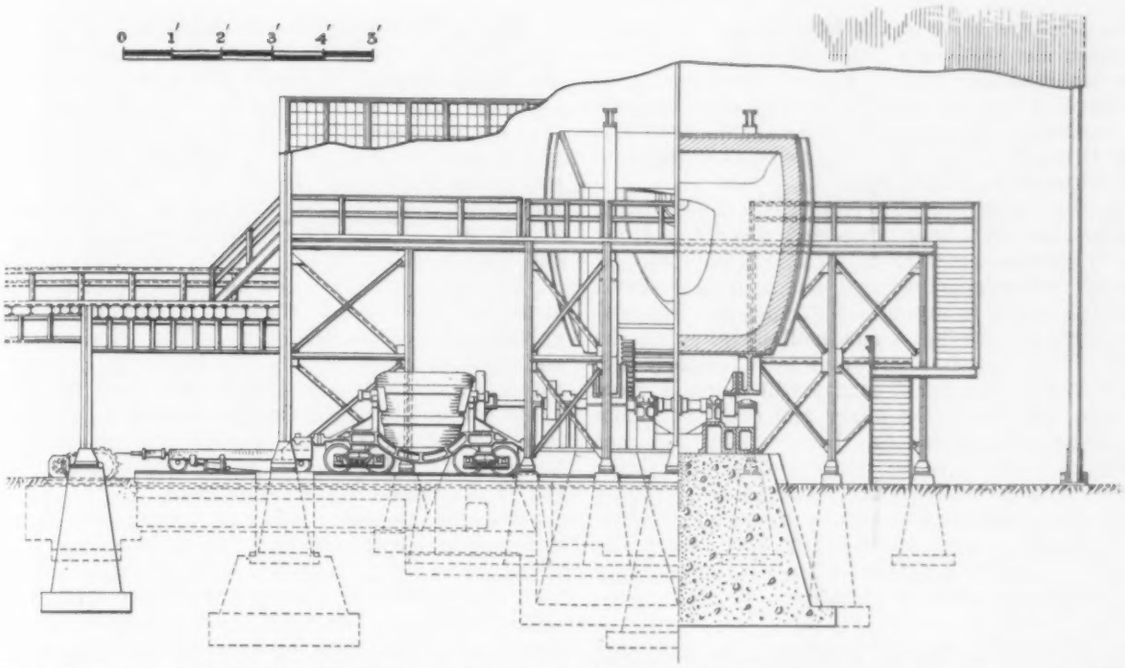
The new scrap yard is 1131 ft. long, including a section on the extreme north end for breaking pit scrap. The span of the crane runway is 100 ft. The yard is served by one 10-ton combination scrap and bucket crane and two 10-ton bucket cranes. The buckets used are motor-operated and the magnets are 60-in. in diameter. The scrap-breaking section is served by two 25-ton traveling cranes. Both are equipped with auxiliary hoists and are arranged for magnet. The ball used is a steel casting and weighs approximately 19,000 lb.

The drop, or scrap-breaking crane runway, is much higher than the scrap yard runway, allowing the ball a free drop of 108 ft. It is arranged, however, so that the regular yard cranes can operate in this section.

Between the scrap yard and open-hearth Plant No. 2 there is a space for future storage of coal and for gas-producers for the open-hearth furnaces should occasion arise.

Ten Open-Hearths in New Plant

Open-hearth Plant No. 2 consists of ten Laughlin furnaces. They are 34 ft. in length at the hearth, by 15 ft. wide, and were originally designed for a capacity of 60 tons, but each has been length-

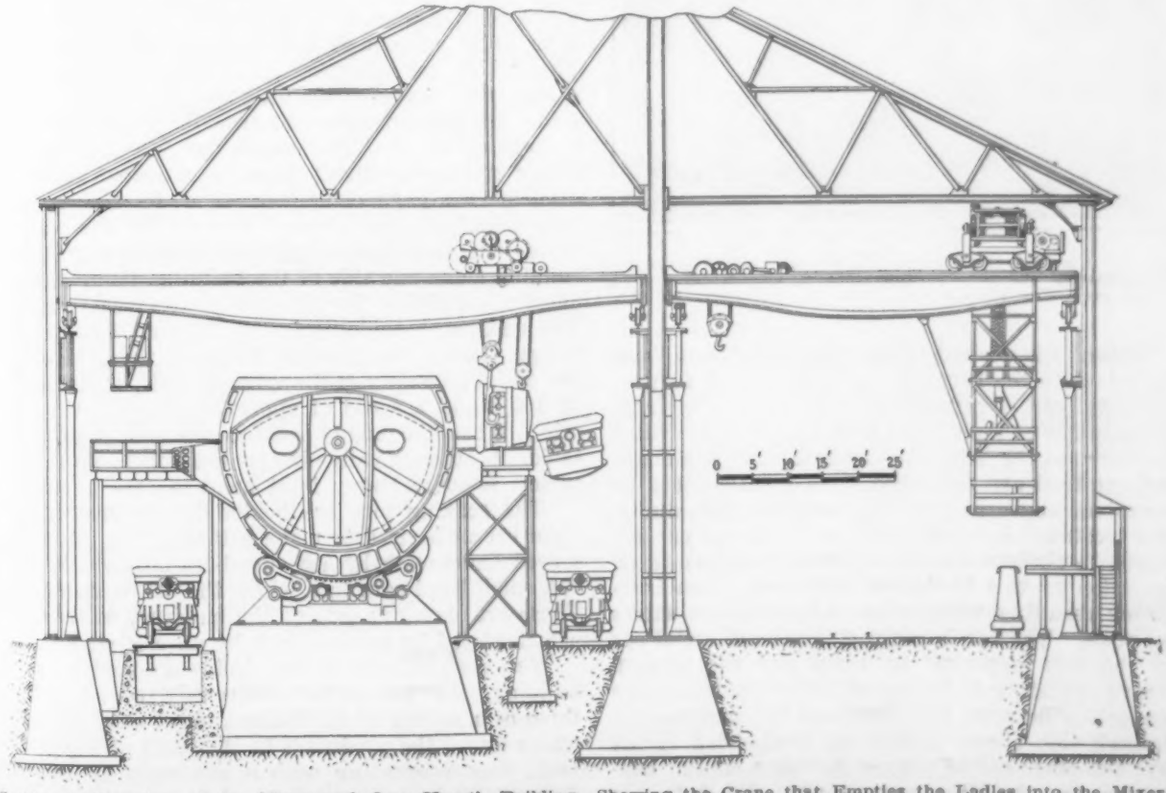


Sectional Elevation of the 600-Ton Mixer and of the Ladle Car and Apparatus for Drawing It From Beneath the Mixer Spout and to a Point Where It May Be Lifted by Overhead Crane

ened 4 ft., thereby increasing their capacity to slightly over 90 tons. The furnaces are operated on heavy oil and tar, but chambers as well as flues are in for gas. Oil and tar enter the plant in tank cars and are unloaded by gravity into three 50,000-gal. storage tanks, and from these are pumped into three 300,000-gal. storage tanks. The furnaces are served on the charging side by two 75-ton cranes, with 78 ft. span, used for delivering molten iron from ladle cars to the furnaces. They are also served on this side by three 7½-ton floor chargers. The charging boxes are loaded with scrap in the yard and delivered by locomotive over an inclined trestle to the charging floor.

On the pouring side the furnaces are served by two 150-ton ladle cranes with a span of 54 ft. Each furnace has a complement of ladles, including a 100-ton steel ladle and 300 cu. ft. slag ladle. Each furnace is also served by a 6½-ton jib crane. For repairing ladles there is a large brick-lined pit below the floor level, which allows the men to work without interfering with operations, or being interfered with. The cranes in this building are served by a 5-ton repair trolley running across the building, which cuts down the time required to repair cranes considerably.

The open-hearths are each equipped with a waste heat boiler, these being connected with the



Sectional Elevation of the Mixer and Open-Hearth Building, Showing the Crane that Empties the Ladles into the Mixer, as Well as that Which Serves the Pouring Side of the Open-Hearths

waste gas flues between the furnace and the stack, and after the waste gas passes through the boilers it is delivered to the stack beyond the boilers. To take care of the loss in draft because of these boilers, turbine-driven fans are employed to draw the gases through the boilers. The boilers are tied into the high-pressure steam main.

In the extreme south end of the open-hearth building has just been completed a 600-ton Mohr semi-cylindrical hot metal mixer. It is motor-driven through worm gearing, and has a double drive, either of which is capable of driving it. The motors are each 80 hp. The molten iron for the mixer will follow the same route as it formerly did, and the same hot metal cranes will dump it from the iron ladles into the mixer and deliver it from the mixer to the furnaces. However, in order not to tie up operations on the charging floor when transferring metal from the mixer to the furnaces at the other end of the building an electric locomotive is used to pick up the ladle and car at the mixer end of the building and deliver it opposite the furnace for which it is intended.

Close-up View of the Excavation for the 40-in. Blooming Mill, Showing the Size of the Hobs It was Necessary to Remove. The picture was taken in February, 1916

When it is desired to transfer molten iron from the mixer to the furnaces a standard blast furnace hot-metal car is run onto a scale directly in front of the mixer on the ground level and the mixer tilted to pour into the ladle. All operations of the mixer and car haul are controlled from a scale house on the mixer platform. In this room the scale dial is also located. A feature lies in a special car designed to obviate the usual takeup necessary in an operation of this kind, and gets away from inaccuracy resulting when a heavy cable drags across the scale. The car is coupled to the hot metal car on the side opposite the scale and the take-up sheave operating it is located below the track, one connection between the hoist and the car passing through this sheave and being dead-ended in the car; the other end of the car having a similar connection for the rope and running direct to the hoist. This gives the usual reversing operation.

From the scale, the hot metal is run out by means of the car haul, and set in a space clear of the mixer platform. From this point the 75-ton traveling crane picks the ladle from the car and sets it onto another car located on the charging platform. The latter car is coupled to the electric locomotive heretofore mentioned. As stated before, the hot metal ladles and cars are interchangeable with those operating between the blast furnace and open-hearth plants.

The open-hearth building is constructed of structural steel and is enclosed in corrugated and galvanized roofing and siding. The window sash and frames are of wood. The building, including the mixer section, is approximately 1000 ft. long.

In conjunction with the open-hearth plant there is a mold storage yard, 68 x 273 ft., served by a 10-ton crane. The molds are carried to and from the yard by narrow gage equipment.

Running parallel with the open-hearth plant and located between it and the mills is the ingot stripping building, a steel structure, semi-enclosed with galvanized and corrugated roofing and sided with steel sash. The building is 50 x 64 ft. and is served by a 150-ton stripper crane. It is the usual practice in stripping ingots in this stripper to have a train of empty ingot mold cars on a track running parallel with that containing the loaded ingot molds and in stripping the molds from the ingot they are lifted off and set on the empty cars with one movement of the crane trolley. The track system in the building is a three-track system, which has been found very effective.

The 40-in. blooming mill, billet dock and soaking pits are separated from the open-hearth mold yard and the stripper plant by a yard 30 x 300 ft., used as a runway for trucks delivering material.

Protected Soaking-Pit Cover Mechanism

The soaking pit section contains 20 pits arranged in batteries of four, each pit having a capacity of ten 22 x 24-in. ingots or equivalent. They have motor-operated covers through a system of worm gearing, chains and wire rope, the last named alone being exposed to danger from falling ingots. The drives are equipped with limit switches, to prevent over-travel of the pit covers in either direction. The pits are served by two 10-ton cranes with a span of 80 ft. The ingots are brought from either storage or direct from the stripper on the same narrow-gage equipment used in the open-hearth and stripper plants. Control for the cover drives and the ingot buggy are located in pulpits running along one side of the building, from which damper regulation for the pits is also controlled. The soaking pit building is 372 ft. long. The ingot buggy travels the distance between the pits and the 40-in. blooming mill approach table, a distance of 360 ft., at a speed of approximately 300 ft. per min. When the buggy reaches the mill approach table, it automatically dumps the ingot onto the table. A spare buggy is at hand in case of need.

The soaking pits are heated by producer gas. Coke breeze is used to make bottom. The pits are served underneath by ash chambers into which are run small hand cars into which the ash is dumped. These are then run outside the building, where the ash is placed in gondola cars by an electric crane.

The gas-producer house adjoins the soaking pit building, the gas being delivered to the pits through a system of brick-lined, sheet steel piping, which leaves the producers in the form of a gooseneck, then connecting with a gas main 66 in. in diameter at its largest point and 54 in. at its smallest. The gas is delivered to the pits by means of

downtakes and underground gas flues. In connection with the piping, dust removers, or baffles, are located at the point where the piping leaves the building, these removing foreign matter from the gas and depositing it into hoppers below the producer floor. Thence it is removed by elevator to an overhead hopper, then going to gondola cars outside the building. The ash from the producers proper is disposed of by this same system. The entire output of one producer is required for each battery of pits. There are six producers, one serving as a spare.

The coal handling equipment consists of an underground track hopper, bucket elevator extending 135 ft. into the air, chutes, small delivery cars and hoppers. The coal is unloaded into the track hopper from the cars and is hoisted by means of the elevator into the chutes. From these it is deposited into the delivery cars, which run over large hoppers located above the producers, and from these the coal is deposited into the producers as required. This system also serves the coal-fired boilers, which will be described further on.

The gas-house building, 31 x 144 ft., is constructed of steel, with galvanized and corrugated roofing and siding and steel sash. The soaking pit building is of similar construction.

Water Supply—Present and Future

The important question of water supply was cared for in a manner that places running water at every imaginable necessary point, that provides insurance against the breaking down of a part of the system, and is of such capacity that expansion can be met. When the new plant was built, the water needs of Plant No. 2 were served by an intake and pump house located on what was then the lake front between the blast furnaces and coke plant; the total capacity being 15,000,000 gal. per 24 hr. The new plant, of course, required additional pumping facilities and, to provide water for some time to come, there was built at the northeast corner of the plant, directly adjoining the lake, a new pumphouse and intake. The intake is 105 ft. long, and now furnishes water for three pumps, each with a capacity of 3500 gal. per min.; two with capacities of 4200 gal. per min. and five with capacities of 8000 gal. per min., all motor-driven.

This gives a pumping capacity of approximately 85,000,000 gal. per 24 hr., in addition to what was previously had, or a total of 100,000,000 gal. per day. The total consumption for the whole of Plant No. 2, including blast furnaces and coke plant, is 67,000,000 gal. per day, giving considerable spare pumping capacity. The water is served to the different branch lines by 36-in. cast-iron mains, which are cross-connected between the two pumping stations, making a flexible system.

The new pumping station is constructed of brick, with steel roof trusses and wood and sheet-iron roof. The windows are of steel sash. The building extends over part of the intake, and has space for six additional pumps. The pumps are in two rows, one along each side of the intake, and each row is served by a 6-ton monorail hoist, which runs through the doorway and out over standard broad gage tracks. The intake is so arranged that it can be extended by means of a flume along the company's pier to whatever point in the lake is thought desirable, so that clean water is assured.

The sewage disposal system for the new plant consists of three brick sewers emptying into the lake. These, of course, take care of branch sewers, and, in addition to an old coke plant sewer and blast furnace sewer, comprise the sewage system for Plant No. 2.

Equipment Wanted for French Steel Plant

A letter has been received by THE IRON AGE from Etablissements Arbel, 24 Rue du Rocher, Paris, France. This company before the war operated steel works and rolling mills at Douai and Couzon. The letter states that the plant at Douai, established in 1896 and employing 2500 men, was completely destroyed by the Germans, but it is now the intention to rebuild.

The company desires to begin reconstruction work as soon as possible and to this end requests information, descriptions, catalogs, etc. of the following:

Open-hearth furnaces of 30 tons capacity for Thomas pig iron and scrap.

Mechanical apparatus for handling ingots up to 60 tons.

Gas producers for coal containing 30 per cent volatile matter and 19 to 22 per cent ash.

All the accessories for the making of open-hearth steel.

Slabbing rolling mills for ingots of 3000 kg.

Plate mill for widths up to 3 meters.

Rolling mill for light plates up to 2 meters wide and 1 mm. thickness.

Furnaces for ingots and slabs.

Electric motors.

All the accessory apparatus, such as rolls, cars, shears, etc.

Forging presses for ingots up to 60 tons.

Furnaces with forges for the above-mentioned presses.

Overhead traveling cranes specially for forging.

All the machine tools necessary, such as lathes, planing machines, slotters, milling machines, etc.

Forging presses for the manufacture of railroad axles and machine tools for finishing.

Hydraulic stamping press.

Presses for flanging automobile frames.

Different tools for the construction of freight cars.

Material for a converter steel foundry making castings up to 3 tons.

Molding machines for machinery castings and car wheels.

Apparatus for sand blast, also foundry supplies.

Material for open-hearth steel foundry making castings up to 30 tons.

Special machine tools for the finishing of heavy pieces, reaming machines, milling machines, drilling machines, vertical planers, slotting machines, etc.

Gear cutting machine for work from 150 mm. up to 1 m. 500 mm. in diameter.

The letter concludes by saying: "We would be fortunate if after having had the help of the United States in battlefields, we can have it again in repairing the wreck made by the common foe, with the sole aim of suppressing in the future a competition that every day became more apparent."

Greaves-Etchells Furnaces in Spain and Italy

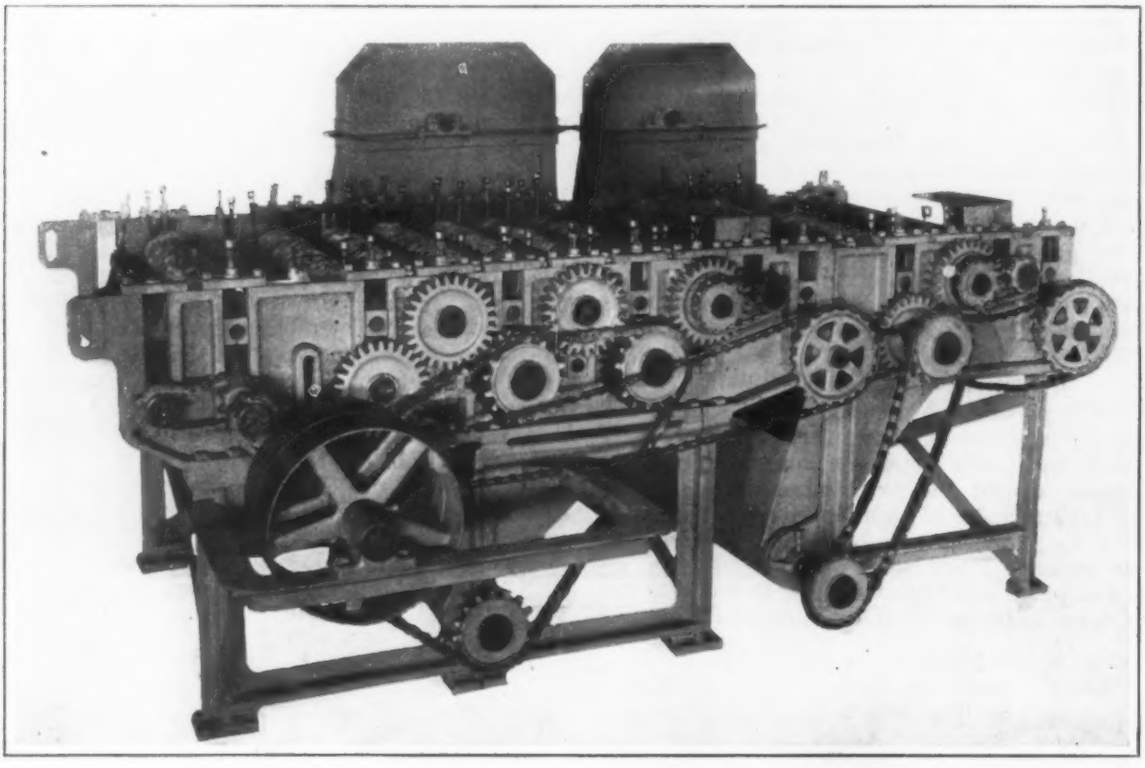
An order has been placed with the Electric Furnace Construction Co., Finance Building, Philadelphia, for an electric furnace for the manufacture of ferroalloys for Spain, by the Sociedad Española de Construcción Naval, the advisory committee of which consists of the British firms of Sir W. G. Armstrong, Whitworth & Co., Vickers, Ltd., and John Brown & Co. This is the first furnace of its kind to be erected in Spain for converting the country's ores into ferroalloys.

The Electric Furnace Construction Co., Finance Building, Philadelphia, reports the following orders received for Greaves-Etchells electric furnaces: Lancia Co., Turin, Italy and Bresciana Co., Brusche, Italy; new furnaces have also been successfully started up at the Daimler Motor Co., Coventry; at the Tyne Electric Steel Foundries, Ltd.; and also a furnace for Kayser-Ellison & Co., Ltd., Sheffield, designed for up to 15 tons cold metal or 20 tons hot metal process.

Auxiliary Tin-Plate Cleaning Machine

An auxiliary cleaning machine for use as an attachment in connection with its standard cleaning machine for cleaning tin plate has been brought out by the Aetna Foundry & Machine Co., Warren, Ohio. Several leading tin mills have been experimenting with these machines for some time with success and the outfit has now been standardized.

As is well known, the tin plate as it leaves the oil bath has an uneven coating of oil in bloches. The function of the auxiliary is to remove the surplus oil and distribute the remainder in a thin even coating over the plate. For this preliminary cleaning process the old flannel disk rolls no longer serviceable in the main



Auxiliary Used in Connection With Standard Machine for Cleaning Tin Plate

cleaners are entirely satisfactory in the auxiliary. Bran from the standard cleaner which would ordinarily be thrown out is made to serve a second time in the auxiliary and is used until thoroughly soaked. It is stated that a highly polished clean plate not obtainable before is produced, and in addition the rolls and bran give double service which is an item in reducing the cost of production.

The auxiliary carries two sets of flannel disk rolls and a separate bran elevator. A feature of the elevator is the use of two flight screws or worms. The upper worm carries the bran to the center of the machine and drops it in the center of the lower worm, which is a right and left hand flight. In this way the bran works out from the center towards the housings, thus to give good distribution.

The drive is from the regular cleaning machine through link chain. The halftone herewith does not show the double worm feature as this has been added very recently.

Technical Men Available

Arthur Woods, assistant to the Secretary of War, writes to THE IRON AGE that registered at his office at Washington is a list of experts and technical men of all kinds who have been discharged from the army and are now seeking positions in civil life. "The hero of to-day is not to become the hobo of to-morrow," says Mr. Woods, "and until every one of these returning men is back at his old job or a better one we have not discharged our whole duty toward them." He adds that all of the men to whom he refers have handled men in the field under the most trying conditions, and could be depended upon in these more peaceful days better to perform such duties. He says that employers have done much in co-operating with the United States Employment Service, and urges that still more be done. Detailed information can be obtained by addressing Arthur Woods, Assistant to Secretary of War, Washington.

Grinder for Metal-Cutting Circular Saws

A new model automatic grinder for metal cutting circular saws has been placed on the market by the Wardwell Mfg. Co., 110 Hamilton Avenue, Cleveland. The machine was designed for resharpening slitting saws, slotting saws and cold saws, ranging from 1½ to 18 in. in diameter.

The manufacturer emphasizes the feature that the machine can be used for resharpening screw slotting saws where the teeth are as small as 36 to the inch. The teeth, it is stated, can be sharpened at a speed of 45 per min., and to within one-half of one one-thousandth of an inch alike.

It is explained that when the saws are resharpened they will cut more material than when new. This is explained as being due to the scale on the temper being broken through and the heart of the temper entered when the saw is reground. Where a gang of saws is used, they can be resharpened and kept to the same diameter through regulating a certain adjustment on the machine. The grinding wheel runs in heavy bronze bushings and has radial and thrust adjustments.

The N. & G. Taylor Co., Philadelphia, is equipping a laboratory at its Cumberland, Md., steel plant for physical tests and research work along microscopic and macroscopic lines. Isaac Berman, a graduate of the laboratory of Sauveur & Boylston, Boston, will have charge under direction of R. C. Drinker, consulting metallurgist. This laboratory will supervise tests and experiments of the various grades of steel produced by the company, for use in the manufacture of fine tinplate and heat-treated forgings.

Desulphurizing in the Pig-Iron Mixer

Striking Results from a German Investigation—Explanation of the Chemical Phenomena —Possible Application to Basic Open-Hearth

A MOST interesting paper has recently come to hand on the theory of desulphurizing in the pig-iron mixer, originally published in *Stahl und Eisen* the latter part of 1916, and written by L. Blum, chief chemist at Esch, Germany. While this paper is most valuable in itself as regards the results presented and the theories drawn from them, it is still more valuable in its possible application to basic open-hearth practice. The removal of sulphur in the basic open-hearth is extremely difficult, and yet there are many times when it is necessary to attempt it. Particularly in recent

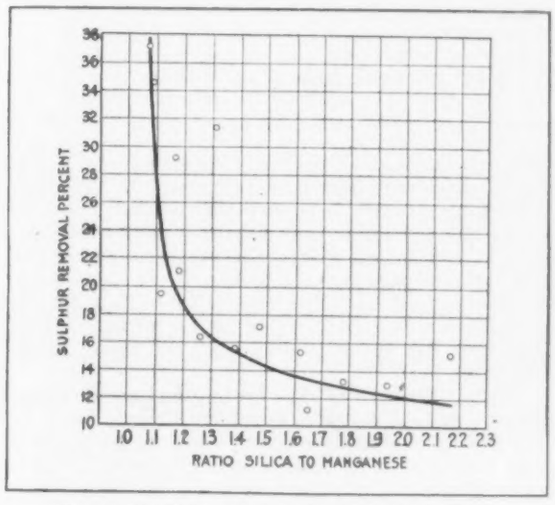


Fig. 1—Results of Analyses of 70 Mixer Slags

years it has become increasingly difficult to make low-sulphur steels due to the increase in sulphur in the materials used in steelmaking.

It is possible that the application of similar methods to those used by Mr. Blum will be of great value in solving this most important problem. The paper starts by pointing out that the mixer has almost completely lost its importance as a desulphurizing agent, which was its chief purpose when first introduced in Germany. This is summed up in a statement by Osann in 1915: "We know that often there is no desulphurization in the mixer, without being able to determine the cause. The pig iron lies dead in it." This observation is often confirmed in practice. The results with an ordinary 800-ton mixer of the general type used in that country since the mixer was put in operation are shown below:

Period	Sulphur in pig iron Per cent	Sulphur in mixer iron Per cent	Total sulphur removed Per cent
1913 to 1914.....	0.085	0.057	32.94
1914 to 1915.....	0.069	0.050	27.54
First 6 months, 1915 to 1916	0.067	0.057	14.92

This decrease in surphur removal in the ladles and mixer is striking, and the search for a satisfactory explanation was the reason for the work done. Brief reference is then made to the present theories of desulphurization such as the formation of manganese sulphide in the liquid metal, which rises to the surface because of its low specific gravity and is absorbed by the slag. Simmersbach estimates its specific gravity as 4.0 compared to 7.0 for the liquid pig iron. An Austrian theory is that alloys of iron, manganese and sulphur are formed which are lighter than the purer metal and rise to the surface like cream from milk. Here a slag is formed rich in sulphur which can be removed.

During the tapping of pig iron, its transportation in ladles and pouring into the mixer, there is considerable contact with air whereby manganese and silicon are oxidized and silicates of iron and manganese formed. Real mixer slag can therefore be considered as a mixture of these two silicates with sulphide of manganese. As further constituents there are found the slagged brickwork and lining of the ladles and mixer, and often large amounts of blast-furnace slag. The latter is proved by the presence of lime, which can only come from this source. The line of attack was to see the relation between the silica-manganese ratio in the mixer slag and the sulphur, for it had long been noticed that with a high manganese content the sulphur in the slag was high, and with high silica it was low. Accordingly a table was prepared of 70 mixer slag analyses showing silica, iron, manganese, lime, magnesia and sulphur percentages. By means of the lime content and the knowledge of the average blast-furnace slag analysis the sulphur and silica introduced by this slag were calculated, showing the sulphur and silica really in the mixer slag itself. The last column of the table shows the ratio of silica to manganese in the mixer slag.

The results given in this long table are shown graphically in Fig. 1, the co-ordinates being sulphur in the mixer slag and silica to manganese ratio. It is clearly seen that there is a definite relation between the sulphur contents and this ratio. With high basicity of the slag, that is, high manganese and low silica, there is high sulphur. With increasing silica content the sulphur quickly drops until with a ratio of about 2.00 the slag is practically free from sulphur.

The next thing to determine was whether there was a connection between the decrease in sulphur content of the mixer slag and the desulphurization of the iron

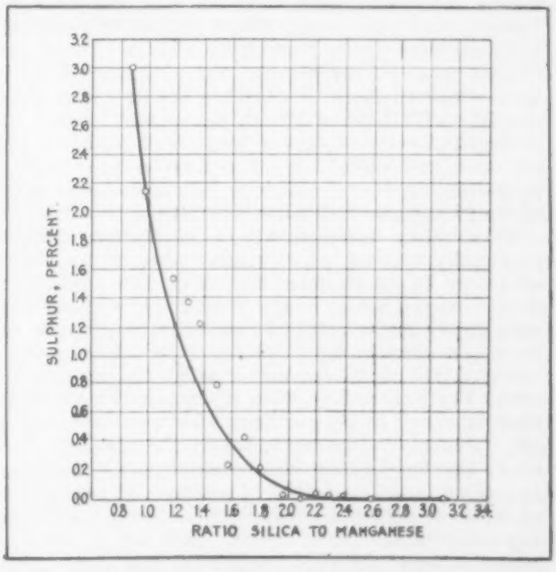


Fig. 2—Connection Between the Silica-Manganese Ratio and the Percentage of Desulphurization

in the mixer. Further tables were prepared, the first showing monthly average analyses for 13 months of the mixer slags and raw pig iron and mixer iron. The pig iron varied in manganese from 1.13 to 1.44 per cent. The slag analyses were calculated as in the previous case and the clear connection between the silica-manganese ratio and the percentage of desulphurization is shown in Fig. 2. From the tables and diagrams the following conclusions can be drawn:

With an increasing silicia to manganese ratio in the mixer slag there is a corresponding decrease in the sulphur contents.

There is also a corresponding decrease in the percentage of desulphurization of the iron while in the mixer.

The author then gives his explanation of these facts. If the mixer slag is considered as essentially a manganese silicate with the formula $MnO \cdot SiO_2$ then there must be sufficient oxide of manganese present to combine with all the silica. If there is not enough then the excess of silica unites with the oxide of iron always present to form iron silicate. In the course of desulphurization sulphide of manganese rises from the metal and enters the slag, but silicate of iron and sulphide of manganese cannot exist together. The reaction which takes place can be shown:

$$MnS + FeSiO_3 = MnSiO_3 + FeS.$$

The sulphide of iron is again absorbed by the bath, so that we do not have to deal with stoppage of desulphurization so much as back-sulphurization.

Next an attempt was made to determine how high the ratio, silica to manganese, must be to bring about the most thorough desulphurization possible. Slag No. 1 was taken from the first table, which showed 4.79 per cent sulphur. This slag shows 32.98 per cent manganese necessary to combine with the silica and sulphur present (not including that introduced by the blast-furnace slag), and gives a ratio of 0.82. Allowing a small excess it can be assumed that 0.80 is the proper ratio of silica to manganese in the mixer slag to bring about most complete sulphur removal. If this ratio is exceeded then the conditions are provided for the formation of silicate of iron with the attendant decomposition of sulphide of manganese, and decrease in the resultant desulphurization, until when the ratio rises to about 2.00 there is complete loss of desulphurizing power. The ratio of manganese to silica in manganese silicate is 1.09, the difference between 0.80 and 1.09 shows the manganese necessary for the formation of sulphide of manganese. The above theory explains the fact noticed sometimes that while in the mixer the iron takes up a slight amount of sulphur instead of losing any.

There are other conditions that exert an influence on the mixer slag, which do not depend on the analysis of the pig iron. They depend on the strong affinity that oxide of manganese has for silica. Due to this all substances rich in silica are attacked by the mixer slag, such as the lining of the ladle and mixer. Only the best bricks should be used, and those high in alumina. It is known that newly lined mixers give better results for desulphurizing, due to the brickwork being less attacked. The best results would be obtained by lining ladles and mixer with basic instead of acid material, such as is used for the basic Bessemer converter. G. B. W.

How Graphite Forms in Iron-Carbon Alloys

With a view to throwing light on the actual mechanism of the formation of graphite in iron-carbon alloys, Kuniichi Tawara and Genshichi Asahara, of Tokio University, Japan, recently placed before the Iron and Steel Institute a paper on the results of an investigation by them and carried out at the expense of G. Aikawa. An abstract follows:

"As the presence of impurities such as silicon and manganese influences the formation of graphite, the iron on which the experiments were made was prepared from pure magnetic iron-sand found in Western Japan (Tyûgoku), an analysis of the sand revealing the following low percentages of other elements than iron: Carbon, 0.15, silicon and silicic acid 0.08; phosphorus, 0.01; sulphur, 0.01 per cent with a trace of manganese. Copper was entirely absent. Some 27 samples of iron were prepared from this sand by melting in a Morgan crucible with hard charcoal, the attempt being made to keep the charcoal in the final ingots at 3, 3.5, and 4 per cent, and while this did not prove practicable the percentage in no case exceeded 3.93, and in only two out of the 27 samples fell below 3 per cent.

"The alloy obtained was a white iron containing practically nothing but iron and carbon, the percentage of silicon in no instance exceeding 0.06 and being in many cases as low as 0.01 per cent. The authors, therefore, justly claim that the formation of graphite must have been determined in all the experiments solely by the physical conditions under which the samples were cast. These conditions were represented by the temperature reached in the melting, which was effected in a gas furnace; the temperature at the moment of running; the temperature of the mold; the time occupied in cooling; and the method of cooling. The temperature of the melt ranged from 1274 to 1436 deg. C.; the casting temperature from 1233 to 1399 deg. C., while the temperature of the mold was kept at 1100 deg. C., except in three instances, one of which was a chill at 50 deg. C. The time taken in cooling ranged from ½ hr. to 8 hr.; generally 1½ hr. was given as slow cooling, in one case 3 hr. slow cooling was given, while in others the metal was kept at about 1000 deg. for 8 hr. (7½ once owing to accident) and then quenched in water, while in another the metal, immediately upon being cast, was quenched in water.

"The authors carefully examined the resulting ingots micrographically and chemically. Their conclusions may be generally summarized as follows: Graphitization can take place even when the total carbon present is as low as 2.18 per cent; the amount of carbon present when ranging between 2 per cent and 4 per cent is not a decisive factor in graphitization; the variation in the melting temperature within the range of the experiments appears to have no effect; graphitization does not take place at such a temperature as 900 deg. C., even if maintained for several hours; it may occur at 1000 deg. C., but the most favorable temperature, as used in the experiments, was 1100 deg. C.; under the latter temperature there is no appreciable effect on graphitization whether the cooling begins directly after the cast or after an annealing time of three hours has elapsed.

"The difference of slow cooling and water quenching is not a serious factor in graphitization; in other words, the graphite crystals are not likely to be produced in the later stages of cooling, but at the same time the quenching may limit the graphitization, while slow cooling may favor it. In setting out their theory of graphitization, the authors assume that cementite is always present in molten iron-carbon alloys, and that as it is a compound its constituents may dissociate in the molten state into iron and carbon, and that, even though the dissociation may be small, the carbon atoms set free may serve as the nuclei upon which the graphite crystals are built when the conditions are favorable.

The Elliott & Stephens Machinery Co. has succeeded the Marshall & Huschart Machinery Co., St. Louis, in the St. Louis territory. H. C. Elliott formerly was manager of Marshall & Huschart Machinery Co. at St. Louis and R. R. Stephens had been for several years affiliated with Colcord Wright Machinery and Supply Co. The new company will exclusively represent the following tool manufacturers: the Cincinnati Milling Machine Co., the Cincinnati-Bickford Tool Co., the Cincinnati Planer Co., the Acme Machine Tool Co., Greaves-Klusman Tool Co., all of Cincinnati; the Bullard Machine Tool Co., Bridgeport, Conn.; the Blanchard Machine Tool Co., Cambridge, Mass.; the La-Pointe Machine Tool Co., Boston. The company will be located temporarily at 915 Chemical Building, Eighth and Olive Streets, St. Louis.

The Laclede-Christy Co., St. Louis, has issued a chart showing the range of prices from 1914 to the present time, and indicating what, in the opinion of the company, will be the trend up to 1924. The company expresses the opinion that prices will be almost stationary during the remainder of 1919, 1920 and 1921, declining slightly from 1921 to 1924. "We believe," the company says, "that present prices are not going to decline for some time, and then so gradually that business and prosperity will be stimulated, rather than depressed, by the process. What business needs most right now is boosters. Boost your own business and all business as well, with aggressive sales and advertising effort."

Canada's Heavy Trade with United States

New High Records in Imports and Exports —Decided Increase in Movement of Machinery to the Dominion—New Tariff Rates

BY W. L. EDMONDS

CANADA'S external trade in iron and steel and manufactures of, during the fiscal year ending March 31, 1919, was striking in many respects. Generally speaking, a new high record was attained in both imports and exports, as far as values were concerned.

The import trade amounted to $161,619,059, compared with $159,309,323 in 1918 and $125,613,617 in 1917. During the fiscal year 1915, which carried the first seven months of the war period, it had a value of but $64,799,970.

The outstanding feature in the import trade in iron and steel is the prominent place occupied by products of the mills of the United States. In spite of the adverse influence of embargoes the imports from the United States exceeded by a little over $300,000 the high record of the previous year, the figures being $154,426,648 and $154,113,633 for 1919 and 1918 respectively.

Since the low point of 1915, when Canada's imports in iron and steel from the United States were but $55,462,477, there has been an increase of about 160 per cent.

Imports from United States

While in total value the imports from the United States reached the highest point in history, the proportion they bore to the total from all countries was slightly lower, being 95.54 per cent, compared with 96.73 per cent in 1918. This is, however, a substantial increase over 1914, when the proportion was 82.72 per cent. That which mainly contributed to the lowering of the proportion of imports from the United States was an increase in the imports from the United Kingdom, the value being $5,912,768, against $4,081,681 in 1918. The proportion obtained from the mother country was, however, but 3.65 per cent, as against 12.96 in 1914.

From a study of the accompanying table, which shows Canada's imports in iron and steel and manufactures from the United States during 1919 and 1918, together with the grand total from all countries for the former year, it will be seen at a glance that the trade was saved from a decrease only by the marked increases which took place in certain lines, thus more than compensating for the falling off experienced in others.

The most outstanding increase was in machinery, the total value of which attained the record figures of $45,235,985, or a gain over the preceding year of $10,680,000. This in turn was due to the very marked increase in Canada's importation of traction engines for farm purposes, the value of which was $14,078,663, while in 1918 it was but $1,010,269. There is a twofold reason for this increase. In the first place it is a reflection of the demand for this particular description of machinery as a result of labor shortage on the farms of Canada. A second and greater factor in stimulating the import trade was the fact that tractors costing not more than $1400 in market of production were a year or more ago placed upon the free list, being formerly dutiable at 20 per cent ad valorem. Owing to the higher cost of their raw material, Canadian manufacturers of tractors have been unable to successfully meet the competition of the American-made article and have been seeking restoration of the duty. This the Government has refused to do.

Other kinds of machinery imported from the United States in which increases were recorded were printing presses, rolling mill machinery, ore and rock crushers, and certain portable descriptions.

Shipbuilding Activity

The $6,831,561 worth of angles, beams, knees, etc., is of course a reflection of the active ship-building policy inaugurated by the Canadian Government. The quantity was 1,676,773 cwt., compared with 1,091,631 in 1918 and 524,113 cwt. in 1917. While a number of steel vessels are still in course of construction, the future of the shipbuilding industry in Canada is decidedly uncertain. As the work on the $5,000,000 plate mill at Sydney, N. S., has been discontinued, it looks as if for some time to come the Dominion will be dependent upon foreign markets for its main supply of shipbuilding material.

The improvement in the imports of railway material of various kinds may, in view of Canada's necessities, be expected to continue, although the rail mills and locomotive shops in the Dominion, now that they are no longer called upon to concentrate their efforts upon war work, are in a position to give closer attention to the demands of the home market. Except for brief spells, neither of the two rail mills in Canada was permitted by the Government to manufacture anything but shell steel during the greater part of the war.

Exports of Iron and Steel and Their Manufactures

	All countries	To U. S.
Agricultural implements	$8,023,833	$214,512
Bars and rods	7,844,044	759,450
Billets, ingots, blooms	2,270,721	1,203,045
Castings, n.o.p.	448,087	434,195
Chrome iron	372,767	372,767
Cream separators	185,910	40,886
Engines, gasoline	290,797	28,504
Ferro-silicon and ferro-compounds	2,502,571	586,006
Firearms	1,860,279	1,229,653
Hardware	2,631,893	439,985
Machinery, all kinds	7,048,797	5,421,271
Iron ore	671,195	671,195
Pig iron	313,500	45,604
Rails	624,257	282,752
Scrap, iron or steel	1,282,825	1,277,134
Stoves	87,275	24,154
Tools, hand or machine	2,132,671	815,612
Wire and wire nails	7,789,188	346,934
Other iron and steel	12,335,933	7,884,738

Canadian Tariff

Alterations made in the Canadian tariff on June 5 last should prove of some benefit to certain American manufacturers in their trade with the Dominion. Including the 7½ per cent war duty removed, the changes provide for a total reduction under the general tariff from 27½ per cent to 15 per cent on cultivators, harrows, horse-rakes, seed-drills, manure spreaders, and 27½ per cent to 17½ per cent on plows, windmills, portable engines and traction engines for farm purposes and threshing machine separators, while on hayloaders, fodder cutters, grain crushers, fanning mills, road and field rollers, and other agricultural implements, the rate has been reduced from 32½ to 20 per cent. Rolled iron and steel hoop, band, scroll or strip, 14 gage and thinner, has been placed on the free list.

Canada's export trade in iron and steel and manufacturers of, during the fiscal year 1919, had a total value of $58,716,503. This, compared with the previous year, was an increase of over 28 per cent. Compared with 1914, it is a gain of over 427 per cent. Putting it another way, it was greater by $3,254,026 than the value of the imports from the United States in 1915. Owing to the absence of extended details in the preliminary returns furnished by the Canadian Government, it is not possible to give exact information regarding all the countries concerned in the Dominion's export trade for the year. That the trade with the United States was the principal factor in contributing to the increase is evident from the fact that its total for the fiscal year 1919 was $22,078,394, compared with $11,145,186 in 1918 and $8,415,513 in 1917. Exports to the United Kingdom sank, on the other hand, from $25,671,523 in 1917 to $9,550,774 in 1919. Under the grouped classification of "other countries," the amount was $27,087,335, compared with $14,978,263 in 1917.

France appears as a purchaser of agricultural implements only, $947,238 worth having been shipped to that country against $161,192 in 1917, other lines exported to that country being hid under the classification "other countries."

Canada's Imports from U. S., 1919, 1918, and Total from All Countries, 1919

	U. S. 1919	U. S. 1918	All countries 1919
Agricultural implements	$4,934,055	$5,417,862	$4,944,278
Angles, beams, channels, etc., not less than 35 lb	3,577,039	4,651,450	3,579,336
Angles, tees, etc., n.o.p.	1,929,304	3,192,717	1,931,067
Axles and axle parts	2,023,778	2,586,322	2,026,881
Balls, steel	103,900	106,945	103,900
Bar, band, hoop, strip sheet or plate	10,059,372	12,718,146	11,421,897
Bar iron or steel, n.o.p.	3,211,132	3,232,438	3,213,900
Billets, iron or steel	287,252	577,560	287,252
Bridges or parts	281,498	154,061	281,920
Malleable castings	565,586	282,067	565,586
Castings, not malleable	1,052,483	.....	1,052,483
Steel castings	193,455	.....	199,968
Castings, n.o.p.	.....	2,035,817	.....
Chains, all kinds	706,008	776,426	743,275
Cream separators and parts	1,140,574	981,130	1,221,797
Cutlery, all kinds	869,060	679,461	1,074,564
Boilers, steam	216,805	237,416	271,959
Boilers and parts, n.o.p.	147,860	136,679	148,146
Gasoline and gas engines	6,369,355	6,660,683	6,379,593
Locomotives	573,631	324,635	573,631
Locomotive parts	147,669	171,767	147,669
Steam engines	280,066	339,390	284,379
Ferro-manganese and spiegeleisen	2,136,794	1,354,300	4,288,625
Fire extinguishing machines and sprinklers	117,127	106,055	117,127
Forgings, n.o.p.	379,076	1,214,386	383,779
Firearms	168,408	191,848	179,800
Hardware — builders', cabinetmakers', etc.	523,845	679,080	533,622
Hoop, band, scroll or scrip	1,582,563	2,179,014	1,582,563
Locks, all kinds	407,403	344,831	418,189
Machinery, all kinds	45,235,985	34,555,672	45,902,616
Nail rods	92,253	102,072	92,253
Nails, wire	251,348	762,488	251,348
Needles	175,015	157,089	304,280
Nuts, rivets and bolts	393,539	638,161	396,048
Iron ore	5,048,456	4,159,789	5,932,001
Pig iron	1,977,217	2,875,418	1,979,273
Pipe, cast iron	127,340	132,109	129,844
Pipe fittings	785,953	923,854	786,065
Plate, boiler	1,214,821	835,557	1,218,925
Plates or sheets	2,840,277	2,764,340	2,840,277
Plow plates	1,316,709	996,825	1,316,709
Pumps, hand	206,402	238,296	206,402
Pumps, power	906,772	724,453	935,802
Rails	546,830	637,740	546,830
Railway fish plates	109,904	144,498	109,904
Railway spikes	94,150	64,626	94,150
Railway switches, frogs and crossings	356,234	178,164	356,234
Railway tie plates	81,553	89,887	81,553
Scales, balances, etc.	216,257	198,715	217,552
Scrap, wrought	883,908	229,780	888,883
Screws, all kinds	191,922	219,126	192,041
Shafting	274,840	384,235	274,840
Sheets, Canada plates, Russian iron, etc.	745,016	891,744	745,016
Sheets, galvanized	809,100	1,596,143	809,100
Sheets, 14 gage and thinner	4,351,479	7,334,705	4,353,011
Sheet steel for mower and reaper knives	148,574	95,204	148,574
Angles, beams, knees, plates, etc., for shipbuilding	7,902,702	6,230,252	8,324,780
Skelp iron and steel	4,439,785	4,670,924	4,439,785
Springs for railway cars	319,175	152,473	319,175
Steel for saws and straw cutters	350,338	408,818	354,357
Steel, 20 gage and thinner	115,397	53,201	115,397
Stoves	458,578	492,862	458,730
Surgical and dental instruments	858,765	649,862	892,665
Tires, locomotive and car	1,630,778	1,614,444	1,635,647
Tools, hand	1,043,224	1,018,470	1,055,153
Tubes for boilers	2,176,226	1,484,243	2,192,617
Tubing, brass, covered	203,797	185,255	203,797
Tubing, plain or galvanized	283,091	314,305	283,531
Tubing, wrought or seamless	1,105,794	1,701,776	1,105,794
Ware, granite, etc.	401,019	420,668	406,141
Wire, barb fencing	1,085,575	1,381,125	1,085,575
Wire, all other	2,991,957	3,022,123	3,163,082
Wire cloth	267,858	246,017	271,005
Wire rope	430,788	328,400	937,024
Wire rods	2,484,028	3,337,014	2,484,028
Manufactures, iron and steel, not classified	9,914,113	10,249,548	11,107,926

Canada's principal exports of iron and steel and manufactures of, to all countries and to the United States, articles of home production only being taken into account, are shown in the accompanying table.

The Cambria Steel Co., Johnstown, Pa., is installing a new gas house to contain 51 gas producers for service at its Franklin furnaces, and the Weirton Steel Co., Weirton, W. Va., is building an entirely new open-hearth and blooming mill plant containing 27 producers. Both of these buyers selected the Morgan producer-gas machines. The same selection has been made by four leading British steel plants this year.

Foreign Trade of the United Kingdom

The foreign trade of the United States exceeds that of the United Kingdom and of course leads the world. Only the enormous aggregate of British imports keeps the total of the latter's commerce near ours. Her imports are more than double those of the United States, but her exports considerably less than half our own. For the first three months of 1919, the foreign commerce of the United States totaled $2,528,314,431 against $2,498,261,038, for the United Kingdom. Our exports were $1,812,562,083 against $807,815,388 for the United Kingdom, a cool excess of $1,000,000,000. Our imports were only $715,752,348, while those of the United Kingdom were $1,690,445,650.

From the standpoint of the steel industry, the following items in the import tables of the United Kingdom are interesting, by comparative totals for the first three months of 1913, 1918, and 1919:

	January-March		
Articles	1913	1918	1919
Iron and steel and manufactures tons	583,158	73,946	128,264
Copper tons	35,341	58,230	45,715
United States tons	10,526	32,657	31,441
Chile tons	2,081	2,289	3,187
Australia tons	5,368	5,214	4,052
Lead, pig and sheet tons	52,878	58,069	75,011
United States tons	5,690	8,959	34,231
Australia tons	18,794	35,676	23,802
Quicksilver pounds	980,303	304,655	538,116
Tin tons	12,248	3,967	4,137
Zinc tons	34,235	22,297	32,256
Cutlery hundredweight	1,951	432	1,434
Machines and Machinery:			
Agricultural tons	8,594	10,641	16,991
Machine tools tons	685	4,717	5,077
Sewing machines number	11,649	1,827	16,415
Textile tons	1,016	160	741
Typewriters number	13,627	1,962	5,571

The exports of British products for the same period include the following:

	January-March		
Articles	1913	1918	1919
Iron:			
Pig tons	255,937	114,725	78,074
France tons	39,854	81,743	35,447
United States tons	35,568	7,557	10,262
Wrought and manufactures, tons	75,161	19,523	16,264
Iron or steel, and manufactures of tons	845,593	255,401	340,851
Cutlery hundredweight	12,542	5,627	5,478
Hardware hundredweight	271,918	48,319	56,019
Machines and machinery:			
Prime movers tons	42,572	10,250	9,156
Not prime movers—			
Boilers tons	15,213	4,734	5,242
Machine tools tons	4,584	3,747	2,251
Mining tons	6,828	2,528	2,093
Sewing machines number	17,365	10,234	3,425
Textile tons	41,888	8,403	10,196
Other tons	57,050	14,822	18,626

Despite the monumental growth of the American merchant marine during the war, it is interesting to note that during the first quarter in 1913 the clearance of loaded vessels from British ports included 9,000,000 tons of British ships and 117,000 tons of American shipping, in a total of approximately 16,000,000 tons. The first three months of 1919 recorded the clearance of 5,000,000 tons of British ships and only 40,531 tons of American ships in a total of 7,500,000 tons.

A symposium of experiences in 17 American factory training departments, together with valuable suggestions as to how to carry on instruction are contained in a bulletin, No. 12, of the United States Training Service, Department of Labor, entitled, "How Training Departments Have Bettered Production." Among the concerns whose experience is recorded are a large tool works, an automobile motor builder, a maker of gear cutting machinery, a manufacturer of farm implements and a gun-making plant. Conclusions reached from such experiences are: New employees are more readily obtained from establishments having training departments; training is practicable for any kind of machinery; a broad training is desirable; there is no limit to the extent of competency obtainable; hopeful experiment with any occupation is justified; that the pay of learners is equal to that of untrained labor, and that the turnover is greatly reduced.

Sees Hope for Europe in Economic Crisis

Engineer Reviews Situation in Countries Demoralized by War—America Must Have Hand in Reorganization—Acceptances and Long Term Credits

BY STERLING H. BUNNELL *

REPEATEDLY, history tells us, over large areas of the earth, there has been the experience of a dark age following an age of light. Civilization which had advanced for centuries reached its maximum in a great nation, successful wars were waged, luxury and wealth increased until courage and patriotism were weakened, and then in war and riot the civilization gradually went down and was lost. This kind of cycle took place no less than five times in the Mediterranean world of classical history, and Egyptians, Greeks and Romans successively had their golden ages and declines. Comparison of the history of the various ages and nations shows a progressive lengthening of the intervals and decrease in the severity of the catastrophes.

The reality of the existence at this time of a great crisis is not open to doubt. Its approach was foreshadowed in an address by Richard Martens, a Russian, international trader and shipping man, before the United States Chamber of Commerce at Atlantic City December 3, 1918. He said then that Bolshevist disturbances were probable in Germany, Austria and elsewhere. Famine was impending (and now exists) in European Russia, Germany, Austria and Bulgaria, comprising in all a population of 182,000,000. These people live on potatoes and rye principally and there could not be in all the world a sufficient surplus of wheat to make up the deficiency in their usual food staples. Fats for food were lacking in these countries throughout the war, also oil-cake for stock-feed, consequently cattle decreased and meat and milk supplies were greatly diminished. Textiles and leather had gone to the armies almost exclusively. The country population in rags and barefoot, and with farm implements worn out during four years without supplies, would be incapable of furnishing any very large fraction of the pre-war food supply. The industries of Europe were enormously expanded for war needs, and the agricultural workers had decreased, so that the end of the war must make millions of workers idle. Two hundred billions of dollars were spent on the war, which would impose on the nations involved an interest charge of ten billions, in addition to the current expenses of demobilization and reconstruction.

Mr. Vanderlip Corroborates Predictions

Extreme as these statements were, six months later F. A. Vanderlip, American banker and financial leader, returning from a careful study of after-war conditions, in an address at New York May 26, 1919, stated facts corroborating Mr. Martens' analysis of the future. Conditions in the allied countries are of course not nearly as bad as in the blockaded territory of the former Central Powers; yet Mr. Vanderlip described terrible situations. He said that in England 1,000,000 men are unemployed and receiving a pension from the government. The surplus of workers over the possible needs of British industries is estimated as likely soon to reach 6,000,000, who must be fed at the expense of the nation or deported to some agricultural country where they can work at the production of their own food. Belgium has 800,000 unemployed, and France also has an enormous number. Italy has not yet demobilized because there is no work available for the soldiers when discharged. The freed peoples of Poland, Czech-slovakia and Jugoslavia are struggling in the midst of devastated, war-torn countries, flooded with German, Austrian and miscellaneous war-issued moneys, to establish stable governments capable of maintaining independence. Nearly all European peasants have lost their farm animals and have worn out their farm implements. And, to make the outlook even more hopeless, social unrest is widespread, radiating from the raging terrorists of Petrograd, killing their fellow citizens at home, sending their plotters through all Europe, and flooding other countries with counterfeit money printed on Petrograd presses, and extending to the open or secret circles of anarchy and revolution maintained in every country, including our own.

Every country which was engaged in the war is struggling under a burden of debt, which lies heavy on a diminished population. Europe lost about 10,000,000 bread-earners killed and 5,000,000 crippled, and these would normally have supported 60,000,000 dependents, most of whom must receive their support hereafter from their governments, and so increase taxation. Great Britain alone had a pre-war population of 46,000,000, national wealth about $93,000,000,000, and a debt of $3,500,000,000, amounting to 3½ per cent of the national wealth, $76 per capita of the whole population, or $380 per bread-earner reckoned as one in five of the whole. The interest on $380 at 5 per cent is $19, which was only 6 per cent of the average pre-war earning capacity of the worker. Great Britain has lost by the war about 10 per cent of her bread-earners. If 2 per cent be deducted to allow for women now permanently in men's places, the remaining 8 per cent represents the loss of support of 40,000,000 to 50,000,000 dependents, who must hereafter be pensioned by the government in some form or to some extent. Ninety-two per cent of the former number of bread-earners remain therefore to pay the interest on the British national debt, which was about $40,000,000,000 at the close of 1918. The debt per bread-earner amounts now to $4,700, the annual interest at 5 per cent is $235, and as the average present earning capacity is about $550, the burden to be carried by the British bread-earner in future is over 40 per cent of his earning power. The bread-earner cannot escape paying the interest through any system of special or graduated income taxes. Every article he buys for himself or his dependents carries its share of the taxes imposed on the real estate and buildings of the factory, on materials, on railway transport, and all other forms of impost. In the end he who purchases anything pays the taxes imposed on its production. France, Italy and other countries are not less heavily burdened than the United Kingdom, so that all their workers must provide for an interest charge which will tax the average man over 40 per cent of his earnings.

Influences Against Dissolution

Such is the situation in Europe today, and it is serious enough to be the turning-point of the civilization of a continent. But to resist the forces of dissolution, there are already the powerful forces of love of country and the desire of every man to hold fast to that which he knows by experience to be good. The thought of Belgium, France or England caused their citizens to do their utmost for their country's sake. Repeatedly, the limit of endurance was calculated by military and financial experts, and always the limit was reached and passed without slackening the effort. To the millions of men who looked forward with some measure of hope to the ending of the war, the hope was always for return to the old country and home. Having lived through to the signing of the armistice, it is not likely that the citizens of the countries that have been saved will permit their home world to be shattered to bits in the hope of juggling something better out of the fragments.

*Chief Engineer, R. Martens & Co., 6 Hanover Street, New York.

Every incident in which returned soldiers have faced bolshevism has shown them supporting their government. Even in Russia there is evidence of the ultimate triumph of the patriotism of Russian generals and soldiers over the hired forces of destruction. In every one of the allied nations of Europe, the great majority of rich and poor alike, while agreed as to the existence of former and present abuses, are not far from agreement on their remedies. The crisis of war called out superhuman efforts, and the crisis of reconstruction is taking advantage of them.

The situation after all depends largely upon a state of mind. We have seen in America prosperous times when every one was optimistic and worked and spent his earnings with energy and alternating, without apparent cause, hard times when the same men could find no work to do or have done, and delayed purchases and payment of bills because other men in turn did the same. Whether the state of mind causes the condition, or the condition causes the state of mind, is a question which has no present answer. In Europe a large part of the difficulty will be over when every man's desire for the resumption of peaceful industry is succeeded by confident hope.

High Wages and Prices to Continue

The debts of Europe are tremendous, but many a corporation has staggered on successfully under a load of debt and gradually reduced it to reasonable proportions. The increase of loans and of paper currency has marked up all prices so that the national wealth of the world is probably much in excess of the pre-war figure, just as the shoes we wear are now priced at $10 instead of $5. The average man has loaned money to his government, that is, to himself, under conditions which implied his intention to save in future and so to pay himself annually (through taxation) interest and something on the principal too. Although the average British workman must apparently pay his government 40 per cent of his earnings, the whole amount comes back to the same average man as interest on his average holdings of government bonds. High wages and prices must continue for the present, but eventually with continuing stability and returning confidence the debts may be refunded at lower interest rates.

If the ingrained coolness, sanity and perseverance of the European working class continue to exist, their governments will be able to cope with the extremely difficult situation and find means, with the help of America and Americans, to put their people to useful work. The difference between the half-starved serf of the Middle Ages and the prosperous peasant of the time just before the war was simply that the peasant, like his ancestors for many generations, was able each year to do a little more than barely feed his family. So, roads were built, better tools invented, and many comforts added to the bare necessities of life. The progress was always from the known things of the day toward the unknown better things of the future. In Europe today there is the contrast between the devastated regions, or the half-tilled regions, and the marvellously improved country in Belgium, France and England, to point the way of progress. Serbia, and Russia, when her enemies within are overcome, will work toward the ideals of their Allies. Similarly, the example of America is now before Europe as never before. The incredible tales from across the ocean of monstrous machines and gigantic methods of work have been illustrated by American cranes, railways and workmen in France. All Europe is now ready to repair the damage and recover the lost time of war by adopting American methods of getting quick results with minimum labor and cost.

Must Share in European Reorganization

Practically, we are already involved in European financial affairs so deeply that we must take a hand in the European reorganization. We shall have to take what is due us partly in the form of securities, that is, shares in European industries. To enable those industries to pay the dividends that will then be due us, we shall have to assist them as we have assisted our own, by extending credit for goods purchased, up to the limit justified by circumstances. Americans will undoubtedly buy whole industries in Europe, instead of merely partial shares in the form of stock. We shall open new mines to replace the coal and metals exhausted by the war, and fit them with American machinery. In doing all this, we shall send representatives abroad to manage, instruct and assist Europe in adopting what is good in our methods, and we shall undoubtedly learn and adopt in America much that is good in theirs.

The thought of extending credit to Europe has a terrifying effect on Americans, used as we are to asking and granting only 30 or 60 days. But extending the usual term of payment requires only the assistance of a banker. If John Smith sells a carload of steel on terms of payment in 30 days, he has neither the steel nor the money until the end of the period. But if he sells the steel on 30 days "acceptance," he has immediately a paper, the accepted invoice, which he can take to the bank for discount, and by the payment of 30 days' interest he can have the money to use immediately. By the aid of a foreign trading bank with branches or correspondents abroad, goods can be sold to a customer in a foreign country, and paid for by a draft which can be discounted immediately, so that the American seller gets the money at once, while the foreign purchaser pays the interest for as many months as the bank in his country is willing to arrange for. That is all there is to the bugbear of long credits in foreign trade, for since America became prominent in international affairs, several powerful banks in this country have prepared to furnish international banking facilities.

The problem of increasing earnings enough to pay the interest on what are really international debts is one that concerns all the world. Therefore, all nations must be interested in the untouched resources of the Far East, Siberia and China, where millions of laborers and millions of acres of ground are ready to produce foodstuffs and supply valuable minerals at great profit to those who equip and manage the necessary new industries. More than ever before, Europe will be a country where men work hard and contentedly to enjoy the many comforts of civilization, but China and Siberia will attract the adventurous ones who demand the chance to find wealth even among hardships and in novel scenes. Columbus discovered America as a country inhabited by savage tribes unsuitable to furnish labor, and centuries were required to import a population which could develop its natural resources. The Far East today has the labor and needs only direction to produce enormous wealth. From the American point of view, it is to be devoutly hoped that the business standards about to be introduced in the development of that wealth will be American.

Early Decision Urged in Fabrication-in-Transit Privilege

WASHINGTON, July 8—An early decision is being urged by Eastern shipbuilders in the case pending before the Railroad Administration involving extension of the fabrication-in-transit privilege to include iron and steel when fabricated for frame work and sections for ships. It is claimed that the extension of the privilege would save approximately $60,000,000 annually to the shipbuilding interests.

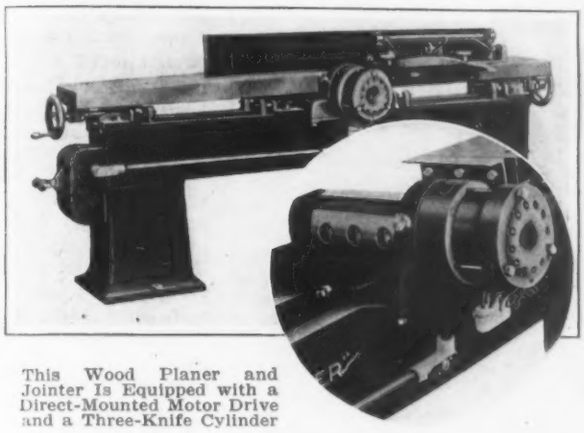
The application has been pending since February, 1918. The shipbuilders, headed by the Chester Shipbuilding Co., Ltd., are urging that favorable action should be taken as a means of the encouragement of shipbuilding industries and the upbuilding of an American merchant marine.

Extension of the fabrication privilege to ship steel would mean a difference of 14.5c. per 100 lb., or from 60c. to $4.20 per ton, depending upon the location of the steel mills and the fabricating plants. The freight rate on bridge, tunnel and building steel shipped from the Pittsburgh district to the Philadelphia district is 24.5c. with an additional charge of 1.5c. when fabricated in transit. Similar steel when intended for shipbuilding takes a rate of 40.5c., and no fabrication privilege is allowed.

Motor Driven Planer and Jointer

The planer and jointer illustrated is manufactured by the Oliver Machinery Co., Grand Rapids, Mich. The features emphasized are the direct-mounted motor drive and the three-knife cylinder. The motor is self contained and operates at 3600 r.p.m. on 3-phase, 60-cycle, 220-volt alternating current.

The outer end of the cylinder, where the pulley is usually mounted, is shaped to receive the rotor of the



This Wood Planer and Jointer Is Equipped with a Direct-Mounted Motor Drive and a Three-Knife Cylinder

motor. The stator is on the outside of the rotor and concentric with it and is held in place by the adapter and the outer end cover.

The manufacturer states that this new type of direct-mounted motor drive has the same large ball bearings as are used on the company's belt-driven machines.

British Iron and Steel Exports in May

Exports of iron and steel from Great Britain in May, 1919, are officially reported as 208,179 gross tons, excluding iron ore and including scrap. This compares with 109,939 tons in February, 1919, with 159,529 tons in March and with 173,606 tons in April. The average per month in 1915, 1916, 1917, and 1918 was 220,670 tons, 279,695 tons, 195,400 tons and 134,826 tons respectively. The pig-iron exports were 20,639 tons against 15,540 tons in April, 1919; in May, 1918, they were 32,892 tons. Ferromanganese shipments were 3329 tons last May as against 10,258 tons in May, 1918.

The movement in steel bars was 29,873 tons, as against 18,762 tons in April, while that of rails was 22,888 tons as against only 7107 tons in April and 3359 tons in March, 1919. The May tin-plate exports this year were 14,041 tons, as compared with 25,195 tons in April, 22,185 tons in March, this year, and with 19,148 tons in May, 1918. The exports of steel plates not under ⅛ in. thick were 26,744 tons last May against 19,876 tons in April, this year and 1,034 tons in May, 1918.

Imports of iron and steel in May, excluding iron ore and including scrap, were 35,031 tons, as compared with 14,367 tons in April this year, and 125,577 tons in May, 1918. The monthly averages in 1915, 1916, 1917 and 1918 were 107,550 tons, 64,404 tons, 43,286 tons and 28,543 tons respectively.

Iron-ore imports last May were 430,232 tons, of which 284,776 tons came from Spain. These imports in May, 1918, were 608,751 tons, of which 396,327 tons were credited to Spain. Pig-iron imports last May were 7246 tons as against 11,325 tons in May, 1918. They were 27,363 tons in February, this year, 14,409 tons in March and 2533 in April. Ferroalloy imports were 206 tons in May, as compared with 2774 tons, largely ferrosilicon, in May, 1918.

Manganese ore imports were 47,467 tons in May this year, as compared with only 2858 tons in May, 1918, and with 36,350 tons the total reported in April of this year.

Copper Production in 1918

The advance statistics of the 1918 output of copper, issued by the U. S. Geological Survey and compiled by B. S. Butler, show that the smelter production was 1,908,533,595 lb., as compared with 1,886,120,721 lb., in 1917, an increase of 22,412,874 lb. The ouput of refined copper was 2,476,077,401 lb., as against 2,507,663,067 lb. in 1917. This is a decrease of 31,585,666 lb. Stocks of copper on Jan. 1, 1919, are put at 180,000,000 lb. or 66,000,000 lb. more than on Jan. 1, 1918. The apparent domestic consumption in 1918 was 1,661,669,576 lb., as compared with 1,315,670,803 lb. in 1917 and 812,268,639 lb. in 1913. Exports of metallic copper were 744,429,741 lb., against 1,126,875,368 lb. in 1917 or 100,000,000 lb. less than the 1913 exports. Imports in 1918 were 576,000,000, against 556,000,000 lb. in 1917.

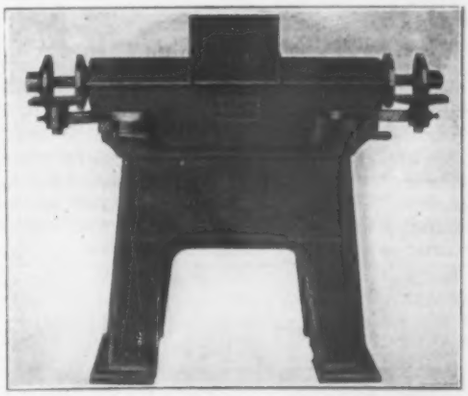
Fabricating Plant to Be Built in Japan

YOUNGSTOWN, OHIO, July 8—President Julius Kahn of the Truscon Steel Co. announces that a plant for fabricating steel is to be erected near Yokohama, Japan, under direction of the American Trading Co., a subsidiary with headquarters in New York. The new enterprise will involve expenditure of $250,000 and is being financed by the Truscon Steel Co., the American Trading Co. and a number of Japanese capitalists. Material is now being shipped to the Orient for the new plant, which will manufacture all products of the Truscon Steel Co. R. F. Moss is to be general manager of the Japan works, while F. W. Shackleton, captain of ordnance in the U. S. service during the war, and former efficiency engineer at the Youngstown plant of the Truscon Steel Co., will be the works manager.

New Heavy Floor Grinders

A new line of heavy floor grinders is announced by the Saint Louis Machine Tool Co., 932 Loughborough Avenue, St. Louis. The manufacturer points out that these machines are made with arbors larger than is usual, of 0.40 carbon steel and with extra coarse pitch, square threads.

It is explained that in the best grinder practice worn wheels are transferred to another machine belted at a higher speed in preference to using a cone pulley machine, thus to avoid the risk of accidents occasioned



Floor Grinder for Heavy Work. Large arbors and copious lubrication are provided

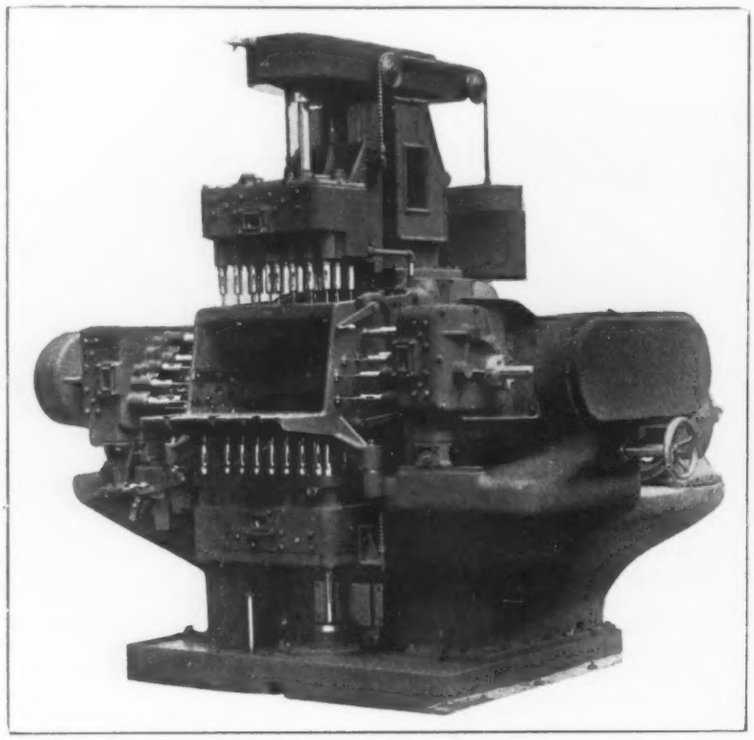
by starting new wheels on the fast cone. These grinders are furnished with plain pulley or cone pulley.

The bearings have large oil chambers which are filled and drained through a pipe connection at the back, and are lubricated by chains thus to provide a large flow of oil.

The machines are made in three sizes, using wheels 18 x 3 in., 20 x 3 in., and 24 x 4 in. respectively. The countershaft is of the double-brace, self-aligning type, and is split-babbitted and ring oiled.

A 60-Spindle Drilling Machine

The illustration shows a 60-spindle 4-way semi-automatic drilling machine, manufactured by the Foote-Burt Co., Cleveland. Machines of this type are constructed especially for work which they are to perform and are built in various combinations, such as two-way, three-way and four-way. The spindles are all set at fixed centers, thus to make it possible to catch a multiple layout of holes which, it is pointed out, would be impossible with an adjustable type. The chief advantage emphasized, however, of the fixed center principle is that the maximum size of spindle and gears are obtained. The jig is a part of the machine itself. The machine is semi-automatic; one lever engages the feed, and all heads feed in simultaneously and return to the starting point, where the feed is automatically disengaged.



Machine Constructed for Drilling 60 Holes in the Top, Bottom and Two Ends of a Four-Cylinder Block

The principal feature over previous models made by this company is the complete lubricating system for all bearings. Oil cups are eliminated, splash lubrication being used throughout. The base of the machine has a compartment for approximately 35 gal. of oil. This oil after being used drains back through a wool filter. All bearings except the spindle bearings are of the Hyatt high duty roller type.

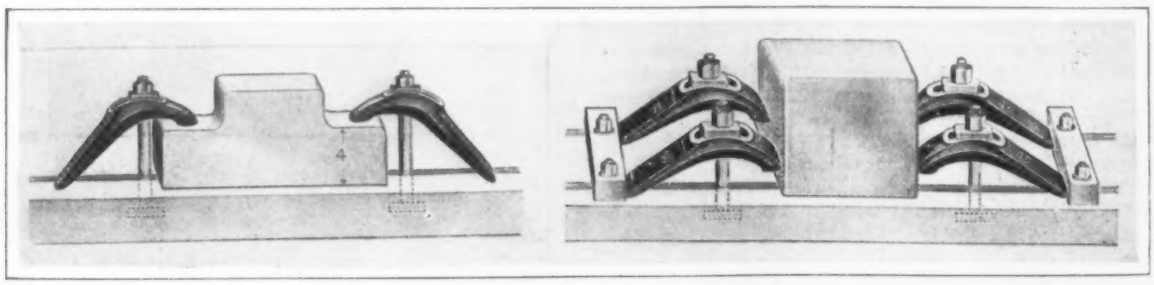
Due to conditions of close center distances of holes required, special alloys are provided for such parts as spindles, spindle gears, etc.

New Type of Machine Clamp

The clamps illustrated are manufactured by Albert O. Mathison, 196 Carleton Street, New Britain, Conn. They are for holding down work on planers, boring mills, drill presses, face plates of lathes, milling machines and also for holding down press bolsters and fixtures.

The slot in the clamp makes the device adjustable for various heights of work. If the work is out of square or taper, it is pointed out that the clamp will adjust itself to these conditions.

The manufacturer states that it is his intention to make the clamp in lengths of 4, 6, 8 and 10 in.



The 8-In. Clamp Adjusted for Work 4 In. in Height. The 8-In. Clamp on Side of Work, Leaving the Top Surface Free for Machining

Economies in Hand-Drill Steel

A valuable paper by H. A. Read of the Rand Mines, entitled "Notes on Economies in Hand-Drill Steel," appeared in the March issue of the *South African Journal* of the Chemical, Metallurgical and Mining Society. Mr. Read, at the commencement of his paper, showed that in the five years ending with 1917 the issues of steel had a value of £310,250, or an average of 86 lb. (in value 27s. 6d.) per native per annum. Consideration of the large sums involved in these issues of steel led to an examination of the losses, and it appeared that one of the principal ones was due to the shanking of the steel under the blows of the hammer, and this in turn led to the conclusion that if shanking losses could be prevented by a permanent drill head an appreciable economy could be effected.

After some experimenting the solution of the problem was found, as it was ascertained that by heating the end of the drill and staving it up (either by a die and dolly in a press, or by hand) so as to give the head of the drill a bulbous or pear shape and subsequently tempering it, the drill would be provided with a head capable of resisting hammer blows without shanking.

The advantages of the new form of drill head are: The saving of steel by preventing the "mushrooming" of the shank end; elimination of danger to natives, as there are no splinters or jagged ends; improved drilling, as the natives have a uniform tempered surface to strike, and the energy hitherto absorbed in shanking is diverted to the work of drilling; improved control of steel, the drill heads being practically permanent, as they can be welded on to other steel; the cost of trimming up and periodic retempering of the old form of drill by lead bath or other method is saved.

The importance of the invention lies in the fact that the work of a large body of natives (averaging 45,000 per annum) is beneficially affected. The author concluded by stating that there was a field for further investigation on the relative losses of steel in different methods of sharpening and determination of which is the best method.

COST-PLUS CONTRACTS

General Goethals Gives His Views on War Expenditures to House Committee

WASHINGTON, July 8—Major General George W. Goethals, retired, who served as director of purchase, storage and traffic during the war, told the House Committee investigating expenditures in the War Department that he thoroughly disapproved of the cost-plus contracts. He said he also objected to producers of materials fixing the prices to be paid by the Government.

General Goethals told the committee that as far back as the latter part of 1917 he had discussed with Secretary Baker the advisability of appointing a Minister of Munitions, which General Goethals believed desirable. Later, the President came out publicly in opposition and nothing more was heard of the policy.

Replying to questions by members of the committee, General Goethals said he believed the services of men engaged in producing the supplies required by the Government could be used to great advantage, but only in an advisory capacity. He did not believe authority to fix prices should be delegated to them. He deprecated the cost-plus-10 per cent system of contracts on the ground that the greater the cost of labor and materials, the larger became the contractors' profit, a situation which must inevitably militate against economy.

General Goethals disclosed the fact that early in the war, during the period when he was general manager of the Emergency Fleet Corporation, he strongly opposed the cost-plus system for the construction of cantonments at a meeting of the Council of National Defense. He said he had urged the construction on "Government force account," the system by which the Panama Canal was built. Under this system, the Government would employ the labor and let the contracts for materials. Such a system, he urged, would prove far more economical and satisfactory, generally, than the cost-plus-10 per cent scheme. He said that during his connection with the Shipping Board, he had abrogated every cost-plus contract he could cancel. As chief of the Division of Purchase, Storage and Traffic, he had permitted no such contracts to be made.

Questioned as whether he believed that the system of making contracts as put into effect at the start of the war by the Council of National Defense had resulted in graft, General Goethals replied in the negative. He said, however, that he believed the system had led to serious and unnecessary enhancement of cost.

General Goethals said that when in January, 1918, he had acquired a grasp on the situation in the Quartermaster's Department, he found that all supplies were being purchased on a basis of an army of 1,300,000 men. He immediately directed, on his own responsibility, that purchasing be conducted for an army of 3,000,000 men. In March, Congress increased the authorized strength to 3,000,000 and he directed that supplies be purchased on a basis of 4,000,000. Later, the authorization was increased to 5,000,000, which he had not anticipated.

Large Saving in Purchase of Steel During the War

WASHINGTON, July 8—That huge savings were made possible by the Council of National Defense in the purchase of steel and iron products during the war, is asserted by Grosvenor B. Clarkson, director of the council.

"It is estimated by the Council that more than $3,000,000,000 was saved to the Government by the prices which its experts on raw materials, minerals and metals made in the procurement of steel and iron products," said Mr. Clarkson. "It is believed that the annals of Government show few, if any, examples equaling the low cost of operation of the council in view of the results achieved."

Plans are being made for the continuation of the council in peace times. Congress authorized an appropriation for the new fiscal year which began last week, consisting of the unexpended balance of the fund of last year. It is planned to maintain the council even beyond that date, Mr. Clarkson stating that a permanent program would be presented to Congress at the regular session in December, when consideration of the appropriation bills for the fiscal year beginning July 1, 1920, is taken up.

"There has been a general realization of the country's need of a council of national defense," said Mr. Clarkson, "that shall in time of peace collect, study and centralize in a scientific way all information bearing upon the national defense, particularly with regard to the mobilization of industries, science, and labor in time of war."

Thompson-Starrett Co. Achievements

The Thompson-Starrett Co., New York, Chicago and Pittsburgh, has published two handsome books illustrative and descriptive of the work which it has done in the past few years, both in the nature of peace and war activities. One of the books, entitled "Building for Victory," carries an article by Col. W. A. Starrett reprinted from the November, 1918, number of Scribner's Magazine, this article having largely to do with the work of the company in building the town of Nitro, W. Va. Reference also is made to the company's record in building the Army cantonment at Yaphank, Long Island, in 100 days. The $50,000,000 powder plant and housing project at Nitro, W. Va., was built by the Thompson-Starrett Co. under the direction of D. C. Jackling, acting as director of explosives for the Secretary of War. The plant and town covered a site of 1900 acres, and upward of 20,000 men were on the payroll. In round figures, it took 35,000 cars to deliver material at the site, averaging during the busy period 300 a day, which means that a car was received and unloaded every two minutes. The project included the laying of 75 miles of standard and narrow gage track, the laying of 133 miles of sewerage and water-piping and 185,000 cu. yd. of concrete, and the use of 31,000,000 brick and 108,000,000 ft. of lumber. There were 3000 individual buildings.

The company's other book is devoted to "Building and Industrial Construction", and shows steel-plate engravings and statistics regarding such well-known structures as the Municipal Building of New York, the Woolworth Building, the Hotel McAlpin, the Bush Terminal Co.'s exhibit building, the Hotel Claridge and similar New York structures as well as other noted buildings in Chicago, San Francisco, Washington, and other cities. The book contains a skyline illustration of lower New York, showing 15 of the most prominent buildings in that part of the city which the Thompson-Starrett Co. has erected. Among these are the Woolworth Building, Equitable Building, Municipal Building, United States Express Building and the Kuhn-Loeb Building. This book also refers to the war work done by the company, embracing such important projects as the Nitro and Yaphank construction, above referred to, and the forging and machine shop for the Chicago Symington Corporation in Chicago; and recent industrial construction, including a complete factory for the American Can Co. at Maywood, Ill.; a coal mining plant at Indianola, Pa.; a reduction plant for the Chili Exploration Co., in Chili; a wood distillation plant for the Tennessee Valley Iron & Railroad Co., Collinwood, Tenn., and other projects which illustrate the diversity of work which the Thompson-Starrett Co. has undertaken.

The Austin Co., industrial engineer and builder, Cleveland, recently secured the following contracts: For the Clover Mfg. Co., Norwalk, Conn., erection of a 90 ft. x 280 ft. building, another structure 35 ft. x 60 ft., and two stories and basement 21 ft. x 52 ft. for $90,600; for the Timken-Detroit Axle Co. an "Austin Modified No. 2 Standard Building," 30 ft. x 300 ft. and another building of similar type, 60 ft. x 120 ft., to be used for heat treating purposes, for $50,000; for the Van Auken Machine Co., Pontiac, Mich., an "Austin Standard No. 1 Building," 60 ft. x 200 ft.

National Employment Service Continued

Congress Grants Reduced Appropriation, Which Will Be Exhausted in Five Months—Charge of Favoring Unions Denied—News of the Labor World

WASHINGTON, July 8—In spite of all manner of attacks in Congress, the United States Employment Service survived and won an appropriation for the coming fiscal year. Only $400,000 was allowed instead of $4,000,000 as requested. However, the Department of Labor had good reason to be thankful that the Service was cared for at all in view of the bombardment by those who accused it of pro-unionism, extravagance and other misdeeds.

It was the belief of many of the congressional leaders that the curtailment of funds would force the Employment Service to confine its operations to a central clearing house and information bureau in Washington, dispensing with the offices and agents in the various States. John B. Densmore, director general, announced, however, that as he understood it, the purpose of Congress was to bridge over the gap until the pending legislation providing for a permanent employment service on a Federal aid basis is passed, which he expects will be by next December. Accordingly plans have been made for a continuation of the work on about the same basis as during the past few months, which will exhaust the $400,000 appropriation within about five months. Federal directors of the Service in the States were instructed to effect reorganization at once and will be allotted funds for the maintenance of one office in each State, in the expectation that the work can be augmented by cooperation with State employment organizations and voluntary workers. In States where there are State employment offices, little work will be done by the Federal Service. Representatives of the Service in the demobilization camps and the special activities on behalf of soldiers and sailors will be continued as heretofore. It is expected that the 2000 emergency bureaus for returning soldiers and sailors, which were operated in cooperation with welfare organizations, chambers of commerce and similar bodies, and which were supported largely by private funds, will continue.

Senator Ashurst, of Arizona, was one of the senators who defended the Employment Service. He said if no appropriation were made for the Service, it would seriously hamper the recruiting of labor in the great wheat belt, imperilling the crops in that region, and that an entirely different machine would have to be set in motion for returning soldiers and sailors. He said the Service is placing between 10,000 and 15,000 soldiers per week, and, including civilian workers, from 60,000 to 70,000 per week.

Answering in detail the various allegations which have been made against the Service, Senator Ashurst said in part:

"The charge that it is a pro-union organization is successfully refuted by the personnel of the State directors, the majority of whom are in the employer class. In addition, the directors in Washington are made up as follows:

"Director General, a lawyer; Assistant Director General, in private life the head of a large insurance company; Acting Assistant Director General, president of a number of manufacturing corporations and a large employer of labor; Director of Operations, director of a railroad and a director in several corporations; Director of Organization, a lawyer.

"Not more than twelve instances can be cited of improper actions having a tendency toward favoring organized labor. Out of the vast energies of this Service, stretching its fingers into almost every hamlet, town, city and village in our country, we discover that only in twelve instances can there be laid charges of improper action in securing a position for a union man as against a nonunion man. This is remarkable in an organization operating 500 offices and which has had during the war a large personnel."

Wage Advances in Great Britain

WASHINGTON, July 9.—Wages of workers in the iron and steel industry in Great Britain have considerably more than doubled during the war, according to figures given by the *British Labor Gazette*. In some cases the increase has run as high as 150 per cent. The average increase for such workers over the prevalent scale prior to 1914 is given as 100 to 120 per cent.

Regarding iron and steel manufacture, this British Government publication says:

In the heavy iron and steel trades (smelting, puddling, rolling, forging, etc.), wages ordinarily fluctuate, under sliding scale arrangements, in accordance with the movements in the average selling prices of pig iron, manufactured iron, or steel. The marked increases in selling prices during the war, together with the subsidies granted to pig iron manufacturers in lieu of an increase in selling prices, have resulted in considerable percentage additions to the standard rates of wages. In addition, special war-wage advances and bonuses have been granted in consideration of the increased cost of living. Blast furnacemen, for example, in Durham and Cleveland, have had increases in wages equivalent to nearly 68 per cent on their pre-war rates, and, in addition, war-wage advances or bonuses ranging from 55 to 69c. per shift. In Scotland they have received percentage increases equivalent to 51 per cent on their pre-war wages, and a bonus of 91c. per shift. The rates paid for Sunday work (which is regularly required from men engaged on productive processes) have also been increased to 50 per cent above the ordinary rates. Iron and steel millmen in the principal districts have mostly had increases of 113 to 117½ per cent on pre-war rates, and iron puddlers in the same districts have had increases of corresponding amounts. Steel smelters, pitmen, etc., generally have received advances ranging, for the higher-paid men, from 60 per cent to 77 per cent on pre-war rates, on different processes. In the case of the lower-paid men, the increase has varied according to the pre-war rates, being over 150 per cent for laborers rated at, say, $5.50 per week before the war.

Increases in wages in engineering and shipbuilding industries are described as follows:

In the engineering and shipbuilding trades, as the result of successive awards given by the Committee on Production, a general minimum war-wage advance has been established of $6.94 per week over pre-war rates for men employed at time rates, and of 10 per cent on pre-war rates plus $5.23 a week for men employed at piece rates, in the federated engineering shops and shipyards throughout the country. This advance has also been adopted by the great majority of non-federated employers. In some districts, where the men are paid at hourly rates, the total war advance for time workers is $7.15 per week. In addition, a bonus on earnings of 12½ per cent for time workers and 7½ per cent for pieceworkers was granted to men, 21 years of age and over, engaged on munitions work, and has been generally extended to men on private work.

Strikers' Assertions Answered

In connection with the recent strike of brass workers at Waterbury, Conn., which was settled as stated in THE IRON AGE of last week by granting an advance of 10c. per hr. to employees working on an hourly basis, piece rates to be advanced 20 per cent, and employees working on a weekly basis to receive an advance of $5.50 per week, the Scovill Mfg. Co. issued a statement setting forth the claims of the men—or rather of the agitators—who had an active part in the strike and also giving the company's answer. The statement is as follows, the paragraphs printed in italics being the allegations of the strikers:

Irresponsible agitators of the I. W. W. and anarchistic type are endeavoring to disturb the industrial situation in this city by circulating false statements

which tend to cause discontent during the reconstruction period through which we are now passing. Some of these false statements are given below with the real facts:

During the war we have worked 13 hours a day and we have been poorly paid.

Before the war 10 hours was the customary day shift and 12 hours the night shift, paid for on straight hourly rates.

In Waterbury during the war 10 hours was the customary day shift and 12 hours the customary night shift, both paid for at much higher hourly rates than before the war. In this plant a war extra and overtime was paid in addition to the regular wages earned.

Night workers worked five nights per week and day workers five and one-half days per week.

When the war stopped thousands of workers were laid off. Wages were reduced, while cost of living increases.

When the war stopped workers were not laid off immediately, but were kept at work; at great expense, while a gradual readjustment program was carried out, which lasted several months. This gave workers who were temporarily engaged in war work a chance to get back into their old occupations, and approximately one-half of them left voluntarily to do so.

Great care was taken to give as much work as possible to those who had dependents.

At the present time work is available for all in peace time occupations, at wages which are in many cases higher than during the war, while reliable Government statistics indicate that the high point has been reached in the cost of living.

In general, statistics show that wages have increased 130 per cent, while the cost of living has increased approximately 100 per cent. Foods have increased less than 80 per cent.

The employer during the war made millions on profit while the employee starved

While the U. S. Government was at war the Government was practically the sole purchaser and reasonable prices were fixed for our products. Profits resulting were largely absorbed by taxes and new construction of machinery and buildings.

Wages paid were higher than ever paid before and increased much faster than the cost of living increased.

How shall we better our condition in the future?

By staying on the job, giving a full day's work for a full day's pay, thus permitting the employer to compete for business on a close margin of profit, pay a liberal wage, and keep the plant running full time. By saving money which would otherwise be spent foolishly.

The workers of Ansonia have gone on strike; the workers of Waterbury must do the same.

If the workers of Ansonia have made a serious mistake why should the workers of Waterbury do likewise? Had the workers of Ansonia stayed at work while the situation was being studied, they would be in a much more favorable position now.

Puddle Mills Idle

YOUNGSTOWN, OHIO, July 8—Both puddle mills of the A. M. Byers Co., Pittsburgh, at its Girard, O. plant have been idle since July 1 as a result of refusal of the men to work until the company signs the wage scale of the Amalgamated Association and formally recognizes affiliation of the workers with the organization. It is understood that the company will agree to the same scale as that proposed by the A. A. and will at any time recognize a committee representing the workers at the plant, but refuses to deal with the men as representatives of the Amalgamated Association. James A. Smyth, a commissioner of conciliation, U. S. Department of Labor, came here to serve as mediator.

An Industrial Assembly

Employees of the Goodyear Tire & Rubber Co., Akron, Ohio, have adopted an industrial representative plan prepared by the company's Council of Industrial Relations. Of the employees voting, 92 per cent favored the plan. Under the plan the plant will have an industrial assembly following the lines of the National and State law-making bodies. There will be a House with 40 members, and a Senate with 20 members, elected by employees, the former for one year and the latter for two years. The two bodies will meet separately or jointly once a month. A representative or senator may be recalled on petition signed by two-thirds of the voters in his voting section and approved by two-thirds of the house of which he is a member. The final authority rests with the management, but, subject to the right of the directors to veto and annul legislation, the industrial assembly will have power to make changes in factory regulations on the subject of wage adjustments, working conditions and grievances. Provision is made to consider various questions by a joint conference between members of the legislative bodies and an equal number of representatives of the management.

Puddlers' Rate Reduced

YOUNGSTOWN, OHIO, July 8—Puddlers' tonnage rates again dropped at the last bi-monthly settlement, in Atlantic City, between representatives of the Amalgamated Association of Iron, Steel and Tin Workers and the Western Bar Iron Association, James H. Nutt, this city, secretary. Examination of sales sheets showed an average selling price of bar iron of $2.50 per 100 lb. during the preceding 60 days, a reduction of 25c. from the average price May 1, when the last previous settlement was made. Under the scale of 1918-19, the price for puddling a long ton or 2,240 lb. of iron was $12.05 on a $2.50 card. The scale, however, has been advanced 5 per cent as the outcome of a conference between the Amalgamated Association representatives and the Western Bar Iron Association. The new rate will apply during July and August. In May and June, puddlers received $13.30 per ton; in March and April, $15.05 on a $3.10 card; and $16.80 in January and February on a $3.45 card.

In the World of Labor

YOUNGSTOWN, OHIO, July 8—About 750 employees, practically the entire force of the Savage Arms Co. at its Sharon, Pa. plant, went on strike July 2 when the company attempted to install a piecework system, instead of paying daily wages as heretofore. J. D. Lannon is superintendent of the works.

By authority of the so-called minimum wage law enacted by the Wisconsin Legislature of 1913, the Industrial Commission on June 30 promulgated an order requiring every employer of a female or a minor over 17 years of age to pay such employees not less than 22c. an hr. The order provides a "learning period" of six months, during which the employer is required to pay at least 18c. an hr. for the first three months, and not less than 20c. an hr. for the second three months. The order applies to female and minor employees in any occupation, trade or industry throughout Wisconsin.

Following a four-weeks' strike of miners at the properties of the Empire Steel & Iron Co., Mt. Hope, near Dover, N. J., the men have returned to work, accepting a reduction of 25c. a day in the wage scale. The agreement was entered into by arbitration. About 300 men are affected.

The War Department has arranged for an immediate reduction in the present working force at the Picatinny Arsenal, near Dover, N. J., aggregating about 50 per cent. The order affects about 400 employees.

The Kohler Co., Kohler, Sheboygan County, Wis., manufacturer of enameled sanitary ware, on July 1 distributed a bonus amounting to $100,000 among its employees who were in its service during 1918 and throughout the first six months of 1919. The rate of payment was 10 per cent of the individual earnings of the employee during 1918.

The Independence Day issue of the *"C-H Messenger,"* the bi-monthly newspaper of the Cutler-Hammer Mfg. Co., Milwaukee, Wis., electric controlling devices, contains many of the photographs and names of the 300 employees in the service. It consists of 12 pages, printed in red and blue ink on white paper.

Technical Reading and Its Advantages to Ambitious Employees

[The following article, by an employee of an iron company at Reading, Pa., gives the result of a personal investigation and indicates the keen interest in trade papers on the part of men in subordinate positions who are ambitious to add to their usefulness.]

"What is your policy with regard to the distribution of technical and trade journals, particularly back numbers, among your shop hands?" I asked a representative of the Reading Steel Casting Co., Reading, Pa., several days ago.

"Well," he replied, "to be candid with you, we seldom have any back numbers of purely technical journals to dispose of, for the reason that most of our department heads, shop foremen, cupola and converter tenders, blow torch operators, chemists and certain office men are allowed to subscribe for periodicals most in keeping with their line of work at the company's expense, the magazine in every instance going direct to the home address of the employee.

"We likewise encourage the rank and file of our men to acquaint themselves from time to time with what is going on in the world of iron and steel, and to that end we maintain a shop library where current issues of all the leading iron and steel technical and trade journals are to be found, in addition to a large number of text books and treatises of special interest to molders, coremakers, machinists, chemists, patternmakers, cost clerks and accountants. Should an employee desire to read or study a book bearing on his particular line of work, which is not to be found in the library, he has only to make his request known to us, when that book will be purchased immediately and placed on our shelves.

"To further encourage the reading habit among our employees, cash prizes are awarded for any suggestions having to do with the betterment of working conditions, the more expeditious handling of our product, the increase in output, the conservation of supplies, or the keeping of our equipment up to date. Only last week a junior clerk in the office was presented a check for $10, for suggesting a simpler way of doing a certain task. The furnishing of technical literature to our men has helped materially to raise the standard of efficiency, to encourage initiative, to promote loyalty, and to keep intact our organization."

Discussing the subject of technical reading on the part of employees with a representative of the Narrow Fabric Co., Wyomissing, Pa., manufacturer of braids and shoe laces, brought to light the fact that this concern, too, heartily approves the plan of putting technical literature within the reach of every individual on the pay-roll. All the leading journals relating to the textile industry are subscribed for by the company, besides many other magazines of general interest, such as *System, Dry Goods Economist, American Exporter,* journals on salesmanship, accounting, advertising and selling.

An office assistant affixes to the front cover of each magazine as it comes in a reading slip of the company's own design, similar, however, to the one described on page 1367 of the May 22 issue of THE IRON AGE. After the executives themselves have had an opportunity of glancing through each magazine, they are immediately passed along to the department heads and foremen for perusal, with the express understanding that the last man handling the magazine is to return it to the office. All such literature is then placed on tables or racks in the shop library, where operatives can do with it as they like, in so far as taking magazines home to read, or copying and clipping articles is concerned. At frequent intervals all reading matter lying around the library that seems to have served its purpose is gathered up by the clerk whose duty it is to clip therefrom for the company's files any articles relating to accident prevention, labor-saving devices, shop management, income tax procedure, etc., the residue being sold as waste paper.

Carrying my investigations still further, I interviewed the purchasing agent of the T. A. Willson Optical Co., Inc., Reading, Pa., manufacturer of safety goggles and optical goods, and learned that while that company has no well-defined system of distributing technical reading among employees, it does maintain that such a movement is a step in the right direction. The officers co-operate with their help in this matter to the extent that all technical and trade journals received by them are sent to the rest and lunch rooms, there to be read or studied by those so inclined.

The tendency among large employers of labor to-day is to utilize trade and technical magazines to the utmost in keeping the greatest possible number of their men informed as to what is going on in the outside world, in so far as their respective fields of activity are concerned. Many concerns, let it be said to their lasting credit, have so systematized the distribution of technical literature that every individual on the pay-roll is accorded the privilege of reading one or more periodicals weekly at the company's expense. One executive I interviewed gave it as his opinion that if every employee would spend even as little as a half hour a day in reading such journals as had some particular bearing on the work he was doing day in and day out that employee would, automatically, advance to a higher position among his fellows.

If it is true that "education ends with life" it behooves every individual who is compelled to work for a livelihood to learn all there is to know about his chosen vocation, through every legitimate avenue of information.

A. S. K.

A Time of Opportunity

Christian Girl, president Standard Parts Co., Cleveland, in the *Standard Parts Messenger,* says:

Not only has peace arrived, with a few exceptions in remote and dark corners, but business, as we understand it in America, is at our doors, rapping loudly for admittance into every nook and corner. Our wealth is great, our energy is vibrant, our conscience clear, our hopes buoyant, and our will to do the natural heritage of a strong people.

We are not entirely unmindful that a wave of unrest is passing over us, but we should not mistake the violence and the misjudgment of the few for the will and the heart of the many. Rather should we join with the good sense and the peaceful hearts of the many to present a united front and cure with sunshine the bad odors emanating from dark places.

It is morning and we should be up and in the field gathering the early crops and tilling and sowing for the midsummer and later crops.

In the business world it is not only morning but a morning in spring time and the call to action is everywhere. True, in some remote corners strength, like peace, has not returned but it is the privilege and duty of America, where truth and strength abide, to work, produce, distribute and build.

We are the source of supply physically, mentally and spiritually and we must not fail, and we need not fail if every man will turn his hand to the plow and take advantage of nature's gifts and her promise of a long summer and a bountiful harvest.

Bust of Sir Henry Bessemer

Sir Henry Bessemer will be commemorated by a bronze bust in the McKinley Memorial at Niles, O. Joseph G. Butler, Jr., vice-president Brier Hill Steel Co., is receiving subscriptions. Checks have been received from steel men throughout the nation varying from $100 to $500, to defray the expense of designing the bust. Among subscribers to the fund are Charles M. Schwab, E. G. Grace, J. Leonard Replogle, W. L. Brown, James A. Campbell, Henry R. Jones and E. G. Langenbach, Canton, the Jones & Laughlin Steel Co. and the Brier Hill Steel Co.

A plan to establish peacetime regulation of explosives was nipped in the bud in Congress when the House last week by unanimous vote rejected a 12-page amendment to the sundry civil appropriation bill inserted by the Senate at the request of the Bureau of Mines. Under its drastic provisions, it would have been unlawful to manufacture, distribute, store, use or possess powder, explosives, blasting supplies or ingredients, except under rules and regulations established by the Government. Small arms and shotgun cartridges only were excepted.

CHICAGO COMPANY EXPANDS

Steel & Tube Co. of America Acquires Mining and Other Properties

The Steel & Tube Co. of America, Chicago, has announced the purchase of the Northwestern Iron Co., Newport Mining Co., Harrow Spring Co., Kalamazoo, Mich., and the Semet-Solvay by-product coke plant at Indiana Harbor, Ind. Steel tubes will continue the main product, being manufactured from the ore to the finished form.

The Newport Mining Co. owns five mines in the Gogebic Range in Michigan at Ironwood and Bessemer, consisting of the Newport, Bonnie, Anvil, Palms, and Keweenaw properties. The total ore is estimated at 14,972,000 tons. The main ore body of the Newport mine has shown a high percentage of Bessemer grades. The total production of the properties in 1918 was 1,866,445 tons.

The Northwestern Iron Co., with iron mines at Mayville and Iron Ridge, Wis., owns and operates two blast furnaces, a rotary nodulizing kiln and a 4-chamber briquetting plant for treating the ore; also 108 coke ovens of the Otto-Hoffman type, quarry equipment, company houses, farm buildings, and other property.

The Harrow Spring Co. makes harrow and rake teeth, agricultural springs, electric steel for automobile springs; also a highly specialized line of products involving heat treating and the use of special steels. Its equipment consists of one 6-ton Heroult electric furnace, one 500-ton bloom forging press, one 24-in. electrically-driven breakdown mill, one 16-in. and one 9-in. bar mill, a machine shop, warehouse, etc.

Before the property acquisition just announced, the Steel & Tube Co. of America owned plants at South Chicago, Ill., Indiana Harbor, Ind., and Evanston, Ill., all on Lake Michigan. After the merging in July, 1918, of the Iroquois Iron Co., South Chicago, Ill., and the Mark Mfg. Co., Indiana Harbor, Ind., the total annual capacity of the company was as follows: Coke, 515,000 tons; pig iron, 750,000 tons; Bessemer steel ingots, 210,000 tons; open-hearth ingots, 198,000 tons; blooms, billets and slabs, 485,000 tons; narrow skelp, 120,000 tons; universal and sheared plates, 180,000 tons; butt-weld and lap-weld tubular goods, 360,000 tons. With its five blast furnaces at South Chicago, one at Indiana Harbor, Ind., and the two just acquired at Mayville, Wis., the company now has a total of eight.

The company has pipe mills at its Indiana Harbor, Evanston and Zanesville plants, consisting of: Five lap-weld mills, having a range in sizes from 2 in. to 20 in. diameter, for the production of oil well casing, oil well tubing, line pipe, steam pipe, and boiler tubes; four butt-weld mills for the manufacture of steam, water and gas pipe, both black and galvanized, and electric wire conduit. The total pipe capacity is 360,000 tons a year. At the Evanston plant there is also manufactured a line of water well supplies.

Before the purchase of the four additional properties, the company claimed to be the third largest producer of pipe and tubular products in the United States. It produces from its own properties zinc concentrates which are used in the manufacture of spelter required for the production of galvanized pipe. It also owns interests in operating coal mines which will supply 40 per cent of coal requirements for coke ovens.

William A. Read & Co., New York, have purchased the entire authorized issue of $17,500,000 7 per cent cumulative preferred stock of the Steel & Tube Co. of America. The stock is preferred both as to assets and dividends, and is redeemable, as a whole or in part, at 110 and accrued dividends on 30 days' notice. Application will be made to list the stock on the New York Stock Exchange.

The Republic Iron & Steel Co. is installing in its tube mills at Youngstown, Ohio, improved threading machinery in the lap weld department, which will considerably increase the threading capacity, and allow this department to keep up, or be ahead, of the lap weld furnaces.

Report of Machine Tools Sold Abroad Not Confirmed at Washington

WASHINGTON, July 8—The Director of Sales of the War Department has cabled to find out the details about the disposal of surplus machine tools with the American Expeditionary Forces, as reported in a dispatch from London. Up to this time, all sales of surplus abroad have been handled by the Liquidation Commission, headed by Judge E. B. Parker, formerly with the War Industries Board, which has been settling contracts and incidentally attempting to dispose of surplus materials. The Liquidation Commission has worked independently of the Director of Sales of the War Department, who had jurisdiction only over surplus in this country. It was stated recently, however, that C. W. Hare, Director of Sales, expects to go abroad in the near future with a purpose of creating a new sales organization which will be co-ordinated with the one in this country.

No official information regarding the reported sale of machine tools abroad has reached the Director of Sales so far. According to the cable dispatch from London, La Construction Metallique de Belgique has purchased from the United States Army all the machine tools it used in France. The prices to be paid were stated to be those of 1914, increased by about 55 per cent. The buyers of the tools, it is said, would have credit for three years at a moderate rate of interest in the case of the goods used to replace those taken by the Germans. The basis for the cable dispatch was a Reuter dispatch from Brussels.

Coke Rates Declared Reasonable

WASHINGTON, July 8—The Interstate Commerce Commission has dismissed the complaint of six corporations manufacturing pig iron against increased freight rates on coke from West Virginia producing points on the Norfolk & Western, and Chesapeake & Ohio railways to Virginia destinations. The case has been pending since Oct. 1, 1917. Concluding its opinion in the case, the commission says:

"It is admitted by complainants that the rates in effect previous to April 1, 1917, were on a low basis, and they made no attack on the increase of 15c. a ton on June 1, 1917, nor do they complain of the increase generally in rates on coke that was granted under Order 28 of the Director General. The complaint is limited to an attack upon the increase in their rates over and above the increase granted on like traffic in other sections of the country. If, as a matter of fact, the rates were lower than reasonable before the increases were granted, they would be comparatively unreasonable with the increases added, assuming, of course, that the general increases were justified. With respect to the general increases, there is no evidence of record and the complainants make no attack upon them."

Wayne Steel Co.'s Steel Plant

The open hearth steel plant being built by the Wayne Steel Co. at Erie, Pa., is expected to be completed about Oct. 1 next. It will contain two 25-ton basic open-hearth furnaces with an estimated annual capacity of 30,000 to 35,000 tons. The products of the plant will be ingots, blooms, billets, bars and small shapes. The Wayne Steel Co. controls the United States Horse Shoe Co., Erie, Pa., and the Canadian Horse Shoe Co., Ltd., Hamilton, Ont.

Orders have been placed by the Buenos Ayres & Western Railway Co. with Armstrong, Whitworth & Co., Ltd., for 10 heavy-type shunting locomotives, each weighing 66 tons. The same firm has also received a contract from the Dutch Colonial Government for 5 superheated passenger locomotives of a similar weight.

Business formerly conducted by the American Pattern Works has been taken over by the new organization known as the American Pattern Works Co., 1551 West Market Street, York, Pa., wood patterns.

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A Premium on Steel Quality

When steel sold for a cent a pound there was much less occasion for demanding quality than exists now. Strength could be obtained more cheaply by using quantity than by demanding quality. With steel at relatively high prices, the alignment is changed radically and economy in the use of steel is attained by seeking quality.

In view of the wide range in tensile strength and other physical qualities of steels on the market a new view should be taken of the subject on account of the great advance in prices. If on old prices a given improvement in physical qualities was worth $4 a ton in the case of steel used for a given purpose, with a higher basis price the same improvement in quality is worth more per ton. Taking another case, if on the old basis it just failed to pay the steel user to buy steel at the premium for quality, it would now pay him well to do so.

The increase in price does not fall merely upon the finished steel as it leaves the mill. There are increments all along the line. The coke, ore and limestone cost more delivered at the blast furnace. The pig iron costs more at the steel-making unit. The scrap costs more. The losses in conversion and in rolling cost more, measured in dollars. The increments are more or less uniform all along the line, and this is natural because the fundamental and chief change that has occurred is a lowering in the value of the dollar. This being the case, it is not only the buyer of steel who needs to appraise things by a new standard. The steel manufacturer must also do this, even to the point of modifying his procedure. If he makes a finished product that involves a certain percentage of rejections, if for instance according to his old practice 90 per cent of his product was merchantable and 10 per cent became lower grade material, salable at a discount, or became simply scrap, a new computation needs to be made to determine whether it pays to allow 10 per cent of the material to be rejected. Under former cost schedules it may have been better to allow 10 per cent of the material to be rejected rather than increase expense of operation by the amount necessary to reduce the rejections to 5 per cent. Under present costs it may pay to take the additional pains necessary to reduce the rejections, by reason of the raw materials used having become more valuable.

In the early months after the cessation of hostilities a common view was that all values were going to be reduced and there was not the incentive to recast appraisals of the relative costs of processes that there is now, when it is established that prices are to stay, broadly speaking, on the high level. It is a new condition and the adjustments involved are many. They include changes in methods at mills and in finishing departments and changes in the selection of steel by a great many buyers.

Steel for French Reconstruction

Some of the comments on the contract reported to have been closed recently by a New York steel export company, a fabricating company and a contracting company for reconstruction work in the Nancy region of France have taken the view that this development calls for a revision of much that has been said recently as to American participation in the rebuilding of Europe. There should be no haste in making up a new opinion on this subject. Every authoritative expression from representatives of the French Government has indicated, as is entirely reasonable, that the reconstruction program would provide for the largest possible employment of French labor. The two foremost things ahead of France are the rebuilding of destroyed cities and towns and the furnishing of the means of livelihood for hundreds of thousands of men released from military service. The French answer to many inquiries from the United States as to the reconstruction policy has been that while the United States might be called on to furnish certain raw materials, and would be asked to assist in financing restoration work, the urgent necessities of the French people would require that their own works and their own workers be employed on these undertakings and in the production of the finished materials required for them.

So far as steel for European rebuilding is concerned there should be no expectation of shipments from this country sufficient to create any problem of ocean transportation, of which there has been

a suggestion in some quarters. The tendency has been in the popular discussion of structural steel requirements for Europe, as it has always been in comment on the relation of domestic building programs to prosperity in the steel industry, to exaggerate the tonnage of steel called for by a given amount of building. The estimates in connection with the reconstruction after the San Francisco earthquake, for example, were wildly exaggerated. The largest year's output of heavy structural shapes in this country was that of 1916—2,649,961 gross tons, or about 8 per cent of the total finished-steel production in that year. The United States will participate in the rebuilding of Europe, but the very large bulk of the requisite materials must be, from the very necessities of the people of Europe, the contribution of European labor.

Promotion for Returning Soldiers

Managers of industrial works have commented on the attitude of some of the young men who left their employment to enter the army or navy and who now return with an exaggerated notion of the increased value of their services in their old work as resulting from their war experience. This is particularly true of young officers, who before they went away did not occupy executive positions, but who believe that because they directed other men in the war they are now equipped to direct men in industry, and are not willing to resume their old subordinate places. Employers have saved places for their men, but in the cases referred to this does not satisfy.

The ambitions of these young men are laudable, but some of them do not seem able to realize just what has happened to them. They have received a new training and made a new application of their energies. They have been taught to command men. A power has been developed in them, in some cases an unsuspected power. They have shown that they have some degree of executive ability. They are proud of themselves, and no doubt justly so. What they fail to understand is that their executive activities have been along a specialized line, in which they had a thorough training before they were given opportunity to command. They return to private life better equipped than ever to take the road leading to success. Many of them doubtless are a greater potential asset to their employers than they would have been had they continued in their former routine. But it is only a potential asset as viewed by the employer and not a certainty. And before the possibility can become a certainty training must begin where it left off at the call of war. The ex-officer must attend, as it were, the officers' training school of his industry. Then, if he succeeds, if his army or navy experience results as he fancies it has, in due time he will get his commission in the army of industry. Long jumps seldom occur in any well-conducted business. The employee advances as an executive personally observes his fitness for promotion. The returning soldier should be entirely willing to demonstrate that his military training represents a corresponding advance in his industrial equipment.

The British Tin Plate Mission

There is no doubt that a cordial reception will be given the joint delegation of British tin plate makers and workmen that is about to visit the United States for the purpose of securing such information as may enable them better to meet American competition. It may well be said that times have changed in the past 25 or 30 years with respect to the interchange of information between manufacturers. The change is no greater in respect to the old time relation, or lack of relation, between the Welsh and American manufacturers than to the relation between individual American manufacturers. The Welsh tin plate producers insisted, when the McKinley protective duty of 1890 was under discussion, that tin plate could not be made in the United States, and they did not conceal their indisposition to impart information that would interfere with their prediction coming true. Precisely the same spirit actuated the American pioneers in their relations with each other. It is the general feeling, rather than the international feeling alone, that has been changing.

Just what the British seek to ascertain with respect to American tin plate making, however, is in doubt. The impression has been created that they seek information whereby closer relations between manufacturers and workmen in South Wales will be established and whereby the men will work harder. Reports have had it that very extreme demands were recently made by the Welsh workmen and that the joint investigation of American conditions was decided upon for the purpose of postponing the issue, the men being given a wage advance of 12½ per cent for the interim.

The accounts of the wage discussion indicate that the British makers represented to their workmen that American competition could be better met if the men would make American outputs, and that the men rejoined to the effect that if the manufacturers would provide corresponding equipment they would produce the tonnage. The inference is that the Welsh tin plate makers regard their hot mills as a very narrow bottle neck and that if the hot mill output were greatly increased the remainder of the mill equipment, the annealing, pickling and other departments, would be able to take care of the increased tonnage. No evidence seems to have been presented, however, to indicate that such is the case.

As to the hot mills, it has been admitted in the discussions between British manufacturers and their employees that American outputs are attained by doubling the crew. Each of the four men who constituted the tin mill crew in the earlier days of American tin plate making now has a helper, while it appears that in the Welsh industry the old organization remains. To increase tonnage by doubling the number of employees cannot materially reduce the hot mill labor cost, while the burden upon the finishing departments would be correspondingly increased.

The greatest disadvantage of the British tin plate maker at the present time is the high cost of his sheet bars, now £13 10s. delivered. Allowing $1.60 as average freight in the United States on

tin plate bars, the difference, at gold parity, is about $1.15 per box. The next disadvantage to the British maker is the difference in exchange. If the price of exchange in New York on London be taken as representative of conditions in export markets, there is a disadvantage of 6.8 per cent, equivalent to about 50 cents a box. The two disadvantages amount to $1.65. The Welsh maker on the other hand has the advantage of scarcely any freight to seaboard, while the Pittsburgh to New York rate is equal to about 29 cents per base box. Thus the three items, cost of steel, difference in exchange rates and difference of freight on product to tidewater, make a net disadvantage to the British manufacturer of about $1.40 per base box.

When the matter of hot mill wages is viewed in the light of this disadvantage of $1.40 per box it appears rather small. The tonnage wage rate in the United States bids fair to run about 90 cents per box. The computation is made on the basis of the slight advances accorded for the scale year beginning this month, with an allowance of 68 per cent over basis rates by reason of the selling price of tin plate, which may be taken as likely to show averages of $6.90 at the bi-monthly settlements, the market price being $7, with 2 per cent cash discount.

It hardly seems probable that the Welsh workmen are disposed to demand wages per box so much above the high American standard of 90 cents as to place the Welsh makers at any great disadvantage on this score. The American rate is very high. It has been producing incomes of $5,000 a year to not a few rollers. On the basis of 75,000 boxes a year output per mill the roller would receive about $4,200 a year. The lowest paid, the screwboy, would receive $1,400. The average of all the men in the crew would be a trifle above $2,400, fully half the men not being particularly skilled. It seems doubtful that the Welsh workmen desire much higher incomes than these, yet these incomes represent only 90 cents a box, whereas the Welsh maker is set back $1.40 per box on account of other items. He will probably find that he has as much, if not more, to learn in departments removed from the hot mill.

An interesting revelation of the state of mind of British manufacturers on present competitive conditions in iron and steel is their recent reference, in discussion of the subject, to the United States and Japan as "our chief competitors." On the one hand, intensified American production at low cost, with "output per person from two to three times as much as it is here," has made it possible "to deliver iron and steel products here at lower prices than the cost of their production in this country." On the other hand, Japanese labor is plentiful and wages are low. "The ironworkers receive something like the equivalent to ninepence per day in our currency; indeed, the wages paid to workers in Japan are possibly the lowest in any civilized country. Production there is at a low cost through conditions exactly the reverse of those operating in the States." Meanwhile, the British worker's output has not recovered after the slackening down that followed the Armistice, and on the testimony of the London *Iron and Coal Trades Review* many people are gradually favoring the idea that perhaps, after all, the nationalization of the means of production and distribution would be of greater advantage than the profiteering by private traders, many of whom in the food distributing trades have made enormous profits during the last three years.

Compensation and Unrest

Workmen's compensation where the employer cannot adopt self-insurance has a tendency to work harm in his relations with his employees. In case of accident his responsibility automatically ceases. The worker is turned over to the insurance company carrying the liability, and the adjustment of compensation under the law is between representatives of the insurance company and the injured worker. If the owner cares to follow the path of least resistance he disappears from the case. He has paid his insurance premiums; the law provides specifically how much the injured employee shall receive, and the payroll is an exact basis of adjustment. The whole proceeding seems cut and dried and certain to work out impartial justice.

But ultimately this path of least resistance may lead to trouble. Disputes arise in compensation cases, as to choice of doctors, ability to resume work, degree of permanent disability and the like. The dissatisfied worker may feel that he has to take his cause to the State compensation board, even to the tribunal of final appeal. Lawyers and doctors get into the case; perhaps their influence may be unwisely or selfishly exerted.

The cumulative effect of a series of such developments is not to be treated lightly. The spirit of comradeship among employees of industrial plants is often very strong in these matters. The grievance of one worker is taken up by others as if it was their own. Experience shows that the whisper goes about that the owners are hand in glove with the insurance people and are saving money for themselves by keeping back just compensation. Such talk usually is utter nonsense, but it is inevitable where the occasion offers. The shop "lawyers" set forth their versions of the statutes, often the result of ignorance or prejudiced reasoning. The law of workmen's compensation is by no means simple. It requires careful, intelligent study, and very few employees really understand it. Generally they know it only by its operation, and if they believe its operation unfair to them it becomes a cause of unrest. It is not rare to have it charged that one of their number has been cheated out of his just dues.

In several States self-insurance is still prohibited by law. In all States only the large companies can afford this method, for unless carried on a large scale it is expensive and perhaps risky. Therefore the insurance companies must do most of the business. They are not to blame for this condition; their methods are businesslike and their policy doubtless liberal. But the personal contact of the employer or his representative, his presence as a third party to the adjustment, is highly important. Sympathetic interest is never so well appreciated nor is its absence so much felt as in the

days of pain and worry which follow an accident. The owner standing beside his employee in the hour of trouble makes a friend. Naturally this is the usual attitude of the men who direct labor; but there is need of special effort to keep the plan of compensation adjustment from operating only as a piece of machinery.

New Institute Members

The directors of the American Iron and Steel Institute have elected the following to membership:

To Active Membership

Craig Adair, Penn Seaboard Steel Co., Philadelphia.
Felton Bent, Lebanon Valley Iron & Steel Co., Philadelphia.
William B. Blowers, the Youngstown Sheet & Tube Co., New York.
John C. Brown, Lebanon Valley Iron & Steel Co., Lebanon, Pa.
William Downs, Burden Iron Co., Troy, N. Y.
Allan Fraser, Wickwire Steel Co., New York.
M. B. Kelly, American Steel Co., Pittsburgh.
Frederick F. Lines, Bethlehem Steel Co., Sparrows Point, Md.
George B. Nisbet, the Brier Hill Steel Co., Youngstown, Ohio.
Herbert H. Pleasance, United Alloy Steel Corporation, Canton, Ohio.
Clement K. Quinn, Malmomen Mining Co., Duluth, Minn.
Frank S. Slocum, Jones & Laughlin Steel Co., Pittsburgh.
Richard N. Weibel, Carnegie Steel Co., Clairton, Pa.
Fred C. Young, Union Drawn Steel Co., Cleveland.

To Associate Membership

Walter J. Bothwell, Union Drawn Steel Co., Detroit.
Jerome G. Bower, Buckeye Steel Castings Co., New York.
Carl D. Bradley, Michigan Limestone & Chemical Co., Rogers City, Mich.
Chester K. Brooks, National Malleable Castings Co., Cleveland.
Josef F. A. Comstedt, New York.
Howard Coonley, Walworth Mfg. Co., Boston.
Louis E. Creighton, Union Drawn Steel Co., Beaver Falls, Pa.
Frederick A. Fuller, Union Drawn Steel Co., Buffalo.
Leonard S. Gans, Twisted Wire & Steel Co., New York.
Irving T. Hartz, Morden Frog & Crossing Works, Chicago.
Raymond W. Krise, Milton Mfg. Co., Milton, Pa.
Marcus T. Lothrop, Timken Roller Bearing Co., Canton, Ohio.
Olin C. Minteenes, Union Drawn Steel Co., Philadelphia.
Karl W. Moynes, Union Drawn Steel Co., Boston.
Frank W. Severence, Glassport, Pa.

Important Chicago Project May Go Through

CHICAGO, July 8.—It is considered probable that the Chicago City Council will pass the Lake Front Ordinance, which provides among other things for the electrification of the Illinois Central, the erection of new passenger station and freighthouse facilities and grade separation work, involving a total expenditure of about $88,000,000. The passenger station alone will cost nearly $16,000,000. Other station facilities for suburban services will involve an expenditure of $1,800,000, while freight houses to be erected between Randolph Street and the Chicago River will cost $17,650,000. The installation of electrification, which is to be extended over a period of 15 years, will cost $22,000,000 additional.

Tariff Commission Continued

WASHINGTON, July 8.—Unsuccessful attempts were made to cripple the Tariff Commission by eliminating the $300,000 item for its maintenance in the sundry civil appropriation bill. The Senate Appropriations Committee struck it out, but the Senate put it back. Senators Sherman and Nelson made attacks on the commission, while Senator Underwood said that while valuable from a historical standpoint, its reports were not of much aid in writing a tariff bill. Senator LaFollette led the fight for the retention of the commission.

CONTENTS

German Destruction in Northern France..... 85
Selling Surplus Government Plants and Equipment.. 90
Hearing on Manganese, Tungsten and Other Claims.. 90
How the Inland Steel Co. Met War Demand..... 91
Equipment Wanted for French Steel Plant..... 97
Auxiliary Tin-Plate Cleaning Machine..... 98
Grinder for Metal-Cutting Circular Saws..... 98
Desulphurizing in the Pig-Iron Mixer..... 99
How Graphite Forms in Iron-Carbon Alloys..... 100
Canada's Heavy Trade with United States..... 101
Foreign Trade of the United Kingdom..... 102
Prospects for Europe in Economic Crisis..... 103
Early Decision Urged in Fabrication-in-Transit Privilege 104
Motor-Driven Planer and Joiner..... 105
Copper Production in 1918..... 105
New Haven Floor-Type Grinders..... 105
A 60-Spindle Drilling Machine 106
New Type of Machine Clamp..... 106
Economies in Hand-Drill Steel 106
General Goethals on Cost-Plus Contracts..... 107
Labor Situation:
National Employment Service Continued—Wage Advances in Great Britain—Strikers' Assertions Answered—Puddle Mills Idle—An Industrial Assembly—Puddlers' Rate Reduced—In the World of Labor. 108-09
Technical Reading and Its Advantages to Ambitious Employees 110
Steel & Tube Co. of America Acquires Mining and Other Properties 111
Report of Machine Tools Sold Abroad Not Confirmed at Washington 111
Coke Rates Declared Reasonable..... 111
Editorial:
A Premium on Steel Quality—Steel for French Reconstruction—Promotion for Returning Soldiers.. 112-113
Compensation and Unrest 114
New Iron and Steel Institute Members..... 115
Tariff Commission Continued 115
Progress in American Standardization..... 116
Hearing in Pittsburgh Base Controversy at Washington 117
Iron and Steel Markets 118
Japan Inquires for 30,000 to 40,000 Tons..... 129
Iron and Industrial Stocks..... 131
June Shipments of Lake Ore..... 131
The British Ferroalloy Market 131
Non-Ferrous Metals 132
Record Domestic Manganese Ore Output in 1918..... 132
Prices, Finished Iron and Steel, f.o.b. Pittsburgh..... 133
Plans of Clinton-Wright Wire Co..... 134
Active Sheet Demand in the Youngstown District..... 134
Navy Accepts Bids on Steel—Large Tonnage of Armor Plates Pending 134
Contracts for Sheet Mill Furnaces..... 134
Improvement in Iron Industries in Luxemburg..... 135
Bar Iron Scale Settled 135
Congressman Criticizes Method of Buying Steel..... 135
Personal 136
Obituary 137
Investigations of Bearing Metals..... 138
Promising Outlook for Foundry Convention..... 138
Machinery Markets and News of the Works..... 139
New Trade Publications..... 147
Current Metal Prices 148

Union Recognition Demanded

WORCESTER, July 7—The 1500 employees of the Graton & Knight Mfg. Co., of this city, manufacturer of leather belting and specialties, went on strike this morning because of the refusal of the company to treat with officials of the Leather Workers' International Union. The latter tendered demands which the company would not receive. The demands include an 8-hr. day in place of the present 55-hr. week; time and a half for overtime, and equal pay for men and women for the same kind of work. The real issue is the recognition of the union. The officials of the company state that the plant will be shut down completely. The company was prepared for this eventuality and steps had been taken to prevent deterioration of leather in process of manufacture.

Molders Get $6 and 8 Hr. Day

A strike of molders in the Fox River Valley district in Illinois was settled July 2, after having been in effect for an extended period. The molders accepted $6 a day and an 8 hr. day beginning Sept. 1. Foundries in the valley resumed operation on July 7.

Progress in American Standardization*

War Economies in Various Industries—Movement for a Broader International Society—The New American Standards Committee

BY G. H. CLAMER

THERE was a time, not so long ago, when there was no United States standard track gage for our railroads. Without standardization of track gage it was impossible for the equipment of one railroad to be used on another. It has only been through standardization of track gage that inter-line transportation has been made possible. We now travel in the greatest comfort from one end of the country to the other without a change of cars. A freight car may be loaded in Maine and without transfer of its cargo arrive in San Francisco or Key West. In fact, it may even be loaded on a barge at Key West and transferred to any part of the Island of Cuba over United States standard gage track.

At the present time very active progress is being made in railroad building in South America and Central America; very shortly activities in the line of railroad building will be resumed in Mexico; and it can be confidently expected that a Pan-American railroad, extending from any part of the United States to Argentina, a distance of 10,000 miles, will become a reality. It is unfortunate, in this stupendous undertaking, that all sections of this railroad should not be of standard gage. A large part of the trackage in the southern countries, as at present built, or in contemplation, is of gage which differs from our own.

I do not believe that there is one single effort which can do more in bringing countries of the Western Hemisphere into closer relationship than the building of a standard gage railroad over this entire distance.

Standard Screw Threads

There was a time within the memory of the present generation when there was no such thing as standard pipe sizes or threads; and even more recently there were no standard machine screws. Each manufacturer had his own special threads. Selfish interests were so strong and the vision so narrow that there was great opposition on the part of the manufacturers to the standardization of screw threads. Each manufacturer wished to compel the user of his machines to come to him for repair parts. He did not realize that his business interests were impaired if a user of his machine suffered inconvenience and perhaps financial loss by the shut-down of the machine from the necessity of sending to the factory to get the necessary repair part.

There is at present before Congress a bill which proposes to extend the life of the commission to standardize screw threads, created under the act of July 18, 1918. Governmental action in the past has legalized other standards. The first attempt at standardization of screw threads, bolts, nuts, etc., was made in 1864 by a committee of the Franklin Institute of Philadelphia. This committee recommended the adoption of the system known as the United States Standard which was devised by William Sellers. In 1906 the Association of Licensed Automobile Manufacturers adopted standards for automobile screws and nuts, and a year later the American Society of Mechanical Engineers accepted the report of its committee on standard proportions for machine screws. The screw threads adopted by this society differ only in very minor details from the Sellers or U. S. standard. This report specifies tolerances and includes standards for taps, special taps, special screws and screwheads of various types. In 1912 the Society of Automobile Engineers enlarged the number of standards.

An Act of Congress in 1893 established a standard gaging system for sheet iron and steel. This was a purely arbitrary standard. Other arbitrary gages are in use for wire and drills as well as for sheets. The only rational system is the decimal system in which the gage number is expressed in thousandths of a unit.

There is a long list of further standardization work which has had its stimulating effect upon industrial progress, but the illustrations I have given are sufficient to emphasize the importance and magnitude of this line of endeavor.

Only within the present century has standardization in manufacturing processes, methods and practice been seriously pursued and so-called scientific management inaugurated. Industrial progress owes much to the adoption of such standardization. In the automobile industry particularly we have outclassed the world because of such standardization. The adoption of standardization in shipbuilding during the war has put America within two years' time in the first rank in this industry.

Quantity production can be realized only by such standardization. At the time of signing the armistice, quantity production in the manufacture of our airplanes was well under way and history will no doubt reveal the fact that this had its part in bringing our enemies to the realization that it was futile to further pursue the war.

Saving by War Standardization

During the war conservation of our resources became an absolute necessity and the work of the Conservation Division would have had far-reaching effect had the war continued. The Conservation Division was organized to perform the function described by the President in his letter to Mr. Baruch as "the studious conservation of resources and facilities by means of scientific, industrial and commercial economies to meet war requirements."

The necessity for such standardization as a war measure was unquestioned, but just how far it would be economically advantageous or economically detrimental in peace times is speculative. Consumers are willing to pay for selection and for the gratification of their individual tastes as to style, color, form, etc. It is this fact which, in a very great measure, has resulted in the enormous number of commodities, differing in only slight degree from each other, now being offered on the market. A reference to but a few typical examples of our war-time conservation will be of interest in pointing out the wonderful possibilities in this direction.

Pneumatic tires, reduced from 232 styles to 9; solid rubber tires, 100 styles to 15; steel pens, 700 to 300; china and crockery, from 1696 pieces to 330; 5500 styles of rubber footwear discontinued, meaning a yearly saving as follows:

29,012,600 cartons.
5,245,300 sq. ft. of lumber.
4,795 tons of freight.
1,526,423 cu. ft. shipping and storage space.
2,250,272 lb. of material that will not have to be dyed.
74,750 lb. of flour and starch.
30,380 gal. of varnish.
125,300 lb. of tissue paper.
49,617 days of labor.

Consider such a matter as the method of packing thread. If marketed with 200 yd. to a spool, instead of 100 and 150, there would be saved 5,146,815 ft. of lumber or 365 carloads. The saving in shipping space of finished product is about 600 cars, in wrapping paper 3½ tons, and in twine 5 tons. Had the yardage been reduced to 100 yd. per spool it would have required over 600 cars to transport the lumber, so that

*Extracts from presidential address before the American Society for Testing Materials at Atlantic City, N. J., June 24.

the total saving is 1200 cars by using the 200-yd. spool.

With these few examples, it can be readily realized what tremendous savings might be effected if a sane policy of standardization were put into effect through co-operative agreements. It means lower cost of production and smaller capital investment, with a greater amount of capital released for more useful purposes.

International Standards for Materials

[The address, after advocating international agreement on the metric system of weights and measures, also international standards for temperature, coinage, gages, screw threads, electrical rating and power rating, passes to the discussion of a new international society for engineering materials.]

So long ago as 1898 there was organized in Philadelphia the American Section of the International Association for Testing Materials. This section was later incorporated as our present society, which then became affiliated with the International Association for Testing Materials. Unfortunately the International Association was opposed to the formulation of international specifications for materials and did not encourage the organization of strong national groups. It is questionable if it is practicable or desirable to revive the old International Association. In this connection, at its quarterly meeting in April, your Executive Committee passed the following resolution:

Resolved, That the American Society for Testing Materials looks with favor upon the proposition of inquiring diligently whether an International Society for Engineering Materials can be formed to take up and broaden the work formerly done by the International Association for Testing Materials.

Dr. H. M. Howe, past-president of this society, is going to Great Britain and France on a number of missions of a similar general nature, and we should be glad if the appropriate engineering bodies in those and other European countries would discuss with him as our representative the propriety of such a step and the means by which it might be brought about. We believe that provision should be made for admitting the neutral countries into this organization.

We believe that the work of such an organization should be broader than was that of the International Association for Testing Materials, and that it should cover the development of knowledge of engineering materials and stimulate the science of testing materials, leading to the erection of international specifications as standards of reasonableness.

International standards of testing are a matter of very great importance and would logically come within the scope of the new International Society if this becomes a reality.

Organized Effort in Making Standards

The work of standardization in this country has been more or less fragmentary. Such work has been undertaken by individual manufacturers, also by individual consumers, and by associations representing only producers and associations representing only consumers.

A great deal of creditable work has been done by the National Bureau of Standards and some work has been undertaken by the American Society of Mechanical Engineers, although the constitution of the latter forbids the adoption of standards. This society, however, accepts its standard committee reports and sets its seal of approval upon the committee's recommendations.

A vast amount of work has been done by the Society of Automotive Engineers in the standardization of automobile parts and recently in aircraft parts. The Master Car Builders' Association and the Master Mechanics' Association have directed their efforts largely to standardization of railroad rolling equipment. The American Railway Engineering Association has devoted its attention primarily to railroad subjects. The American Institute of Electrical Engineers and the Electric Power Club have undertaken much standardization work in connection with electrical equipment. Other standardization bodies are at work in various fields.

With the object in view of co-ordinating the standardization work of these various bodies, to foster co-operation between all interested organizations and Government departments and to avoid duplication of effort, during the past year the American Engineering Standards Committee was organized. This committee was formed by joint action of five national engineering societies. Our society, being one of that number, therefore became one of the founder societies which organized this committee.

The work of this committee had only about begun when action was taken toward greatly enlarging the size and scope of the committee as originally planned, and proposals were made and preliminary action taken to reorganize the committee into an American Engineering Standards Association embracing the subject of safety codes, fire protection, etc.

A considerable amount of discussion has been taking place, questioning if there is any added advantage in having the seal of approval of this committee placed upon the specifications presented to it. It is this function only which the American Engineering Standards Committee contemplated exercising, and this policy will no doubt also prevail if the committee is enlarged and organized as the American Engineering Standards Association. It is quite a serious question as to which is the better method: to grow slowly and conservatively, beginning with an amount of work which can be handled properly in a reasonable length of time, or immediately to attempt to handle the vast amount which has been more lately contemplated and in so doing incur the danger of at once becoming cumbersome and top-heavy. This is a problem which remains for the interested societies to pass their judgment upon. Personally and unofficially, I feel that there is a real field for such a committee or association, and it but remains for the various details as to organization, policy and methods to be worked out, and these should have most careful consideration.

I feel that the approval of such a committee or association would give great weight and added recognition to a specification. I believe, however, that it would be a decided mistake for such a body to attempt to pass upon the substance of a specification, or to choose between two conflicting specifications covering the same subject which may be presented by two distinct standardizing bodies. No such specification should have the seal of approval unless a specification representing the joint action of such bodies be presented. All such standards, when finally adopted as American standards, should be ever open for revision, otherwise practice will become crystallized.

National engineering bodies are in operation in England, Canada, France and Holland, and it can be confidently predicted that such bodies will be organized in other countries in the near future. Because of our present excellent and rapid means of communication, all the countries of the world are being brought in much closer relationship than ever before and in the immediate future there will begin an era of intermingling of the peoples of the various nations of the earth to a far greater extent than ever. It is therefore reasonable to assume that before many years have elapsed the needs of the world will demand international standardization to an ever-increasing extent.

Hearing in Pittsburgh Base Controversy at Washington

The Federal Trade Commission has granted the Western Association of Rolled Steel Consumers a preliminary hearing on July 29 at Washington on the proposed reestablishment of a Chicago base on rolled iron and steel. John S. Miller, counsel of the Association, will present the case for that organization and Judge Gary will be present.

The Superior Commercial Club, which has filed the protest before the Federal Trade Commission against the Pittsburgh basing system, is located at Superior, Wis., and not at Duluth, as stated in THE IRON AGE last week. A Duluth subscriber writes: "Duluth, relying upon the representations and understandings which it has with Judge Gary, is taking no steps at the present time in connection with the Pittsburgh base controversy."

Iron and Steel Markets

FURTHER GAIN IN EXPORTS

Japan a Large Buyer of Steel and Copper

Advance in Nuts and Bolts—Pig Iron Market Shows Both Advances and Concessions

June sales of pig iron in the case of some furnaces equalled the total for several preceding months, and now in a limited way there is pig iron buying for delivery in 1920, including some malleable in the Central West. But many foundries have yet to cover for the fourth quarter of this year. Enough furnaces are going in to make the market uneven in their efforts to get backlog orders. Some cuts are heard of each week but are generally reported as lapses which did not break the market.

Some Southern furnaces that were weak sellers are asking $1 a ton more, the recent heavy bookings of their Northern competitors having turned some inquiry southward. Eastern Pennsylvania still reports concessions on foundry iron, and standard low-phosphorus iron is available at $35. Less than the full price was asked on a round lot of basic wanted by a large northern Ohio steel foundry.

A British inquiry for 20,000 tons of basic iron gives a fair prospect of business. Sweden and Holland and other countries, which see little early chance of getting pig iron from Germany, are now inquiring here.

The withholding of railroad business is hurting the railroads more than it has hurt the steel mills. The Railroad Administration has no present intention of buying 300,000 tons more of rails, as reported. Japan is in the market for 5000 tons of rails, after buying 30,000 tons in the past two months. France wants 5000 tons of rails and an equal amount of plates, and Spain is inquiring for 5000 axles, 10,000 wheels and other equipment. The 40,000 tons of rails on which Belgium has been figuring for some time appear to have gone to British mills at about £19 10s., c.i.f., whereas the British quotation on domestic business has been £15.

Japanese ship plate inquiries in this market include one for 20,000 tons, another for 7000 tons and a third for 5400 tons definitely reported. Japan's program for 200 ships will take several hundred thousand tons of steel, much of which is to be bought in this country. An eastern Pennsylvania plate mill has sold 500 tons for shipment to France at 2.55c., Pittsburgh.

The Chicago district still leads in new structural business, but the largest contract of the week is for 11,000 tons for the Cunard building, New York, taken by the American Bridge Co.

Philadelphia prospects include two buildings which will call for 10,000 tons each. The new Port Huron automobile plant and tributary industries will take 20,000 tons and ultimately several times that amount. Illinois Central electrification at Chicago and Pittsburgh's projected bridges and subways are indications of the large public outlays ahead.

The steel market shows further improvement in exports, with fresh evidence of expanding demand in various lines of domestic consumption, and a growing confidence in the stability of present prices of finished products.

The adjustment of the industry to something under a two-thirds operation promises steady holding of mill schedules through the summer and a probable increase in output as fall advances. There is enough irregularity in prices to keep buyers and sellers alert, but the plentiful talk of possible advances has produced little forward buying.

After taking some good contracts, several makers of nuts, bolts and rivets have put up prices 5 per cent on bolts, $3 on nuts except semi-finished and 10 per cent on rivets. Others have followed suit, but there are still some stragglers.

The Ford Motor Co. is in the market for 10,000 tons of cold-rolled screw stock for delivery in the last half and into next year, and some keen competition has developed.

The demand for steel bars is still a feature both East and West. Implement makers have placed some fairly large contracts for delivery in the last half of this year and reinforcing material is more active.

The agitation by the Western Association of Rolled Steel Consumers for a Chicago base on iron and steel products has led to an appointment for a hearing before the Federal Trade Commission at Washington to-day (Wednesday), Chairman Gary appearing for the Steel Corporation while the association is represented by its attorney.

Japan has been no small factor in the copper advance, the market now verging on 20c. On the whole movement Japan has taken 32,000,000 lb. The surprising development in copper is that the Government surplus which threatened to be a drag on the market for many months has now been entirely sold.

Pittsburgh

PITTSBURGH, July 8.

Opinion is growing that in the main present finished material prices will be maintained through the year. In fact, there have been slight advances by some producers on two or three of the lighter lines of finished products, these being nuts, bolts and rivets, with the prospect of advances before a great while on wire products and perhaps tubes. The advances on nuts, bolts and rivets are not general as yet, but have been made by concerns which are pretty well filled up over the next two or three months, and feel they should have better prices on sales for delivery in last quarter of the year. The heavy demand for wire products and tubular goods with the sold-up condition of the mills would seem to warrant a higher market, but general advances in prices are not favored by some producers for fear of the adverse effect it would have on labor. The demand for sheet and tin plate continues to get heavier and this week the American Sheet & Tin Plate Co. and most of the independent mills are operating their hot sheet and tin mill capacity as full as they possibly can.

While there may be a slowing down in demand for steel during July and August, which is usual in the midsummer season, July is expected on most lines of finished steel to show an increase over June, which was much the best month in point of orders entered and specifications received of any one month since last

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 8, 1919	July 1, 1919	June 10, 1919	July 9, 1918
No. 2 X, Philadelphia‡	$28.60	$29.00	$29.50	$34.00
No. 2, Valley furnace†	26.75	26.75	26.75	33.00
No. 2 Southern, Cincin.†	28.35	28.35	28.35	36.60
No. 2, Birmingham, Ala.†	24.75	24.75	24.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, deliv., eastern Pa.	26.00	26.00	25.50	32.90
Basic, Valley furnace	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh	29.35	29.35	29.35	36.60
Malleable, Ch'go*	27.25	27.25	27.25	33.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh	27.15	27.15	27.15	33.40
L. S. charcoal, Chicago	38.85	38.85	38.85	37.85
Rails, Billets, etc., Per Gross ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh	42.00	42.00	42.00	51.00
Forging billets base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila.	42.50	42.50	42.50	51.30
Wire rods, Pittsburgh	52.00	52.00	52.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.595	2.595	2.595	3.73
Iron bars, Pittsburgh	2.75	2.75	2.35	3.50
Iron bars, Chicago	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, New York	2.62	2.62	2.62	3.145
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.495
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.245
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	July 8, 1919	July 1, 1919	June 10, 1919	July 9, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh	4.25	4.25	4.25	4.00
Fence wire, base, P'gh	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh	4.10	4.10	4.10	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$22.50	$22.50	$20.50	$29.00
Carwheels, Philadelphia	23.00	23.00	22.00	29.00
Heavy steel scrap, P'gh.	19.00	18.50	17.50	29.00
Heavy steel scrap, Phila.	19.00	18.50	16.00	29.00
Heavy steel scrap, Ch'go.	18.00	17.50	16.00	29.00
No. 1 cast, Pittsburgh	19.00	19.00	19.00	29.00
No. 1 cast, Philadelphia	23.00	22.00	22.00	29.00
No. 1 cast, Ch'go, net ton.	22.00	22.00	19.50	28.00
No. 1 RR. wrot., Phila	24.00	23.00	21.00	34.00
No. 1 RR. wrot, Ch'go, net	17.00	17.00	16.50	29.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.25	$4.25	$4.00	$6.00
Furnace coke, future	4.12	4.12	4.00	6.00
Foundry coke, prompt	5.00	5.00	4.50	7.00
Foundry coke, future	5.00	5.00	5.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	20.00	19.25	17.75	26.00
Electrolytic copper, N. Y.	19.75	19.00	17.50	26.00
Spelter, St. Louis	7.15	7.10	6.30	8.62½
Spelter, New York	7.50	7.45	6.65	8.87½
Lead, St. Louis	5.15	5.15	5.00	7.75
Lead, New York	5.40	5.40	5.25	8.05
Tin, New York	70.50	70.50	72.50	92.00
Antimony, Asiatic, N. Y.	8.37½	8.37½	8.37½	13.00
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.75

year. The heads of many concerns are now away on vacations, or getting ready to go away, and some business will likely be held up until their return in a month or two.

The best evidence of the improvement that has come in the steel trade is the fact that makers of ingot molds have lately increased their shipments to the steel mills fully 50 per cent over what they were three months ago. The Shenango Furnace Co., Sharpsville, Pa., which furnishes molten Bessemer iron to the Valley Mold & Iron Corporation at Sharpsville for making ingot molds, has lately blown in another furnace on account of the increased demand for iron coming from this consumer. There is no longer any effort made by consumers or jobbers to have producers cut prices, but rather efforts are in the direction of getting taken care of on the books of the mills, and being assured of a supply of goods when needed. The labor situation is giving a good deal of concern, and a shortage in the supply is already being felt to some extent, especially in wire mills. It is predicted that if the railroads were buying steel the mills would not be able to meet the demand, largely for the reason that there would not be enough labor to go around.

Pig Iron.—Most of the activity in pig iron in this market in the past week or two has been in malleable Bessemer and in foundry, but the demand for steel making iron is more active at present than at any time since last year. Recently a large local consumer of malleable has closed for 10,000 tons or more, and paid for all of it the regular price of $27.25 at Valley furnace. Other malleable iron foundries in this district have been buying iron, and it is estimated 20,000 tons or more have been closed for third and fourth quarters, while on part of it deliveries run into next year. The demand for foundry iron is still active and several consumers are inquiring for iron for first half of next year delivery, but furnaces do not care to take chances by selling so far ahead. A local consumer has bought about 3000 tons of standard Bessemer iron for delivery in third quarter, all at the regular price of $27.95, Valley furnace. We also note a sale of 500 tons of basic at the full price of $25.75, Valley Furnace. Reports are that the American Steel Foundries has bought 5000 to 6000 tons of basic iron about equally divided between its Alliance, Ohio, and Sharon, Pa., plants, and that the iron was sold at about $25 at furnace, a cut of 75c. a ton from the regular price. Local furnaces and dealers disclaim any sales of basic at this cut price, and it is intimated the iron was bought from a furnace in another district. The local pig iron market is stronger in price today, than at any time since last year, and furnaces are refusing to make any concessions from regular prices. We quote:

Basic pig iron, $25.75; Bessemer, $27.95; gray forge, $25.75; No. 2 foundry, $26.75; No. 3 foundry, $26.25, and Malleable, $27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Billets and Sheet Bars.—The open inquiry for billets and sheet bars is not any better, as nearly all consumers have regular sources of supply, but specifications coming to the mills for both billets and sheet bars are much heavier now than any time this year. The sheet and tin plate mills that buy bars in the open market are taking out a great deal more steel, now operating 80 to 90 per cent of capacity. Some consumers believe prices on steel may be higher and would willingly cover their needs for last quarter on the present market. The demand for forging billets is more active, and we note several sales of 100 to 300 tons at the regular price fixed on March 21 last, of $51 at maker's mill, Pittsburgh.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38.50, 2 x 2 in. billets at $42; sheet bars, $42; slabs, $41, and forging billets, $51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—The demand for ferroalloys is light, but prices seem firm and resale material is pretty well cleaned up. A Youngstown, Ohio, consumer bought recently 300 tons of 80 per cent ferromanganese for last quarter at $110 delivered, but this price could not be duplicated today, as the market is higher. Some sales of the lower grades of Bessemer ferrosilicon for de-

livery over last half of the year have been made at the prices named below.

We quote 78 to 82 per cent resale ferromanganese at $115 to $120 delivered, with a reduction of about $2 per unit for lower percentages. We quote domestic ferrosilicon at $80 and 18 to 22 per cent spiegeleisen at $33 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $47.75; 10 per cent, $49.75; 11 per cent, $53.05; 12 per cent, $56.35. We quote 6 per cent silvery iron, $36.75; 7 per cent, $38.50; 8 per cent, $40.25; 9 per cent, $42.25, and 10 per cent, $44.75. About $3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—Some fairly large inquiries for plates for export are in the market, one calling for 10,000 tons for shipment to the Far East. Domestic plate mills expect in the very near future to book considerable tonnage for export shipment, and this may offset to some extent the present limited domestic demand for plates, which has existed since late last year. Railroads are not ordering any tires to speak of, and are erecting very little new work in which plates are used. The market is reported firm by the larger mills, but some of the smaller mills would shade prices $2 to $3 per ton on attractive orders. The general rate of operation among the plate mills is from 50 to 60 per cent of capacity. The regular price on ¼ in. and heavier tank plate, adopted March 21 last, is 2.65c. at mill, Pittsburgh.

Structural Material.—Inquiry in the past week quieted down to some extent, but there is a very large amount of prospective work in sight, some of which will likely come out before the end of the year. The McClintic-Marshall Co., which recently took 4000 tons for the new plant of the Kelly Springfield Tire Co., Cumberland, Md., has been given 3500 tons more for the same job, and has also taken 3500 tons for crane runways and other work at the Brooklyn Navy Yard. The Fort Pitt Bridge Works has taken 400 tons for new buildings for the Nordyke & Marmon Co. at Indianapolis. The Penn Bridge Co., Beaver Falls, Pa., is low bidder on the steel for the lock gates Nos. 1 and 4 on the Little Kanawha River, its bid being $6,252, and expects to receive the order shortly. Pittsburgh is voting to-day (Tuesday) on a proposed issue of $22,000,000 in bonds, the money to be used in building three or four steel bridges across the Allegheny and Monongahela, also several tunnels for street car traffic and a subway to relieve down-town congestion. It is expected this bond issue will be carried, and, if so, it means a lot of work for steel fabricators and other concerns. We quote beams and channels to 15 in. at 2.45c. Pittsburgh.

Sheets.—This week the American Sheet & Tin Plate Co. is operating to about 85 per cent of hot sheet mill capacity, and would be running to 100 per cent were it possible to do so. Independent mills are also running 80 to 85 per cent and orders being received and specifications on contracts are much the heaviest since last fall. Owing to the large increase in demand for sheets, coming mostly from automobile makers, and the fact that a few mills that were cutting prices on sheets are now filled, the market is also firmer than it has been at any time this year, concessions in prices having about disappeared. Mills report an active demand for black and painted corrugated sheets, and some large export orders have lately been placed. Some mills are practically sold up on sheets over third quarter, and on some grades are back in deliveries four to six weeks. Very heavy export shipments of sheets are being made to Japan, South America and other foreign countries. It is said that prices adopted on March 21, last, are holding firm, and these are given on page 133.

Tin Plate.—Operations among the tin plate mills are increasing heavily, the American Sheet & Tin Plate Co. running this week close to 95 per cent of its hot tin mill capacity, while another producer that has 32 hot mills is operating 28 this week, and expects to put the other four on in a short time. Specifications against contracts for tin plate are coming in freely and production and shipments this month will be heavier than in June. Export inquiry for tin plate continues active. The demand for long ternes now used largely by automobile builders in place of galvanized sheets is very heavy, and concerns rolling these are sold up for two or three months. The demand for terne plates is also heavy and mills have all the orders they can turn out for several months or longer. Prices on production tin plate are firm, and it is said there is now very little cutting. We quote production tin plate for last half of the year delivery at $7 per base box, f.o.b. Pittsburgh, but stock plate usually sells at 50c or more under the price of production plate, and stock tin plate is being sold at this concession. Prices on terne plate are given on page 133.

Iron and Steel Bars.—Mills report they are taking more new business in steel bars right along, and in the past week or two implement makers have placed fairly heavy contracts for delivery over last half of the year. One such contract is reported to have been made for 15,000 to 20,000 tons with a local mill. The demand for reinforcing steel bars is heavier, indicating more activity in building operations, and makers of iron bars are having a more active market. Makers state that prices on both iron and steel bars are holding firm, one local mill rolling iron bars shipping its output as fast as made and at regular prices.

We quote steel bars, rolled from billets, at 2.35c., and from old steel rails, 2.45c. Eastern mills are quoting iron bars for eastern shipment at 2.35c., while for western shipment 2.55c., Pittsburgh, is quoted. Pittsburgh mills rolling iron bars quote at 2.75c., Pittsburgh, plus full freight rate to point of delivery.

Wire Rods.—Local makers of rods that sell their surplus in the open market report a fairly active domestic demand, and export inquiry is active, Canada being in the market at present with some inquiries ranging from 300 to 500 tons or more. Canada has been a buyer of rods on this market for some time. The wire demand is so active that the supply of surplus rods is less than for a long time. Sales of high carbon rods are reported at $65 and higher. Prices on rods are reported to be firm, as adopted on March 21 and are given on page 133.

Wire Products.—So far this month, the demand for wire products has been fully up to the same period in June, but July may show a slight falling off in orders booked, due to the usual midsummer dullness. Local wire mills are operating at about 85 per cent and have their product well sold up over the next quarter. On some grades of wire, a scarcity in supply is noted for early delivery. One mill also reports a scarcity in labor in its wire mills. There are no signs of an early advance in wire products, as the effect of such action on labor is recognized. A local mill is now taking orders for wire products for last quarter, being fully sold up to October. Prices are firm, as adopted on March 21, and are given on page 133.

Cotton Ties.—Buying is over, as consumers were covered some time ago for their season needs. July shipments of cotton ties are now going out on the basis of $1.71½ per bundle of 45 lb., an advance of 1½c. per bundle being charged for storage over the June price.

Hoops and Bands.—A little better demand is noted for hoops and bands, but it is still very far from being satisfactory to the mills, which are not operating to more than 50 per cent of capacity, if that much. We quote steel hoops and bands at 3.05c., Pittsburgh, plus usual extras.

Hot-Rolled Strip Steel.—Local mills report the demand better and consumers are now inclined to place orders more freely for delivery ahead, feeling that present prices will hold over the remainder of the year. We quote hot-rolled strips at 3.05c. to 3.30c. per lb., f.o.b. Pittsburgh. The higher price is paid for hot-rolled strips used for deep stamping and drawing purposes, which require extra care in rolling.

Cold-Rolled Strip Steel.—Mills report the demand better and are taking orders for third quarter delivery. It is said prices are holding firm.

We quote cold-rolled strip steel at $5.65 base per 100 lb., f.o.b. Pittsburgh, for 1½ in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Shafting and Screw Stock.—Two local makers report the demand for shafting as more active, and the bulk of the business being placed is still coming from automobile builders and concerns making automobile parts. There is no longer any tendency on the part of large buyers to seek lower prices, but they are more intent now on securing a regular source of supply to serve them over remainder of the year, as there seems to be no doubt that present prices are going to hold. Jobbers are also buying more freely, and carrying larger stocks than for some time, for the same reasons. The present demand for shafting is said to represent 65 to 70 per cent of capacity. Discounts are firm, these being 28 per cent off in carloads and 23 per cent in less than carloads, f.o.b. Pittsburgh.

Nuts and Bolts.—Makers report a very heavy demand, that has come up in the past two or three weeks, and two local makers now report they are running their plants as full as conditions will allow, and have orders ahead for some time. Indications are for a general advance in prices on nuts and bolts in the near future, some makers having last week advanced their discounts 5 per cent. Several local makers state that July business promises to be double that of June. A meeting of the Institute of Nut and Bolt Manufacturers is to be held in New York on Wednesday, July 16, to discuss conditions in the nut and bolt trade. Discounts as effective from March 28 are given on page 133, but most makers are asking the new prices.

Rivets.—Demand is more active than for some time, and prices are firm. A local maker reports operations at about 65 to 70 per cent, with good orders booked for delivery in third quarter. We quote button-head structural rivets at $3.70, base, and cone-head boiler rivets at $3.80, base, f.o.b. Pittsburgh.

Spikes.—Local makers report the demand slightly better, but orders from railroads are mostly for small lots for repair work, there being very little rail laying done at present. Jobbers are buying more freely, and are carrying larger stocks.

We quote standard spikes, 9/16 x 4½ in., and also small spikes, $3.35 base per 100 lb. in carload lots of 200 kegs or more, plus usual extras. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more.

Skelp.—The great activity in line pipe and oil country goods is reflected in skelp, the demand for which has been heavy for some time. The few mills that roll skelp for the open market are reported to be well sold up over the remainder of this year. We quote sheared steel skelp at 2.65c.; universal, 2.55c., and grooved, 2.45c. per lb., f.o.b. Pittsburgh.

Iron and Steel Pipe.—Heavy orders for line pipe and oil country goods are being placed nearly every day, but the mills are probably turning away more business than they are entering, for the reason that they are pretty well filled up over the next quarter, and do not seem anxious to sell very heavily for last quarter. There is some agitation for an advance in tubular goods, but this has not taken definite form. The National Tube Co. has taken 225 miles of 8-in. line pipe for the Sinclair Oil interest and will start next week to roll 15,000 tons of 12¾ to 18-in. casing for the Lone Star Gas Co., having taken recently this quantity of pipe for that concern, which, however, placed a total of 35,000 tons, divided among two or three mills. The demand for line pipe and oil country goods continues very heavy, and is much larger than the mills are able to handle and make the delivery wanted. The demand for butt-weld pipe is also much better, and the mills are getting gradually filled. Mills rolling tubes are now operating at 85 to 90 per cent of capacity, and from all indications will continue to operate at that rate, or heavier, over the remainder of this year. Development of the oil fields is the most active ever known, and promises to continue probably for several years. Prices on pipe are very firm, and an advance in the market by the independent mills in the near future is not improbable. Discounts on iron and steel pipe are given on page 133.

Boiler Tubes.—There is some little betterment in the demand for boiler tubes, but merchant tubes are very quiet. Mills are not actively seeking boiler tube orders, as they are filled up so far ahead on line pipe and oil country products. There is still some shading in discounts on boiler tubes adopted on March 21 last, and these are given on page 133.

Coke.—Blast furnaces that buy coke on contracts are now pretty well covered over last half of the year, but the demand for furnace coke for spot shipment is fairly active. The holiday on Friday, July 4, cut down production to some extent, but nearby plants worked on Saturday, as usual. We note a sale of 50 cars of standard grade blast furnace coke, or about 2000 tons at $4.25 per net ton at oven, and another sale of about 800 tons at the same price. Consumers of foundry coke are pretty well covered over last half, and the demand for spot shipment coke is only fair. We quote standard grades of 48 hr. furnace coke for prompt shipment at $4.25, but some makes, not so high in quality, can still be had at $4 per net ton at oven. We quote 72-hr. standard foundry coke at $5 to $5.25 at oven for prompt shipment, or on contracts. Output of coke for the week ending June 28 in the Upper and Lower Connellsville regions was 138,633 tons, an increase over the previous week of 7433 net tons.

Old Material.—There is something of a lull in the local scrap market at present, consumers holding off buying in order to test the higher prices, while dealers are not anxious to sell, so that the market is really marking time. No large lots of scrap are pressing the market to find sale, and dealers are firm in their ideas on prices. The Midvale Steel & Ordnance Co. has an inquiry in this market for a large tonnage of borings and turnings for delivery at Johnstown, Pa., but the prices offered are not attractive to local dealers, and the business has not been closed. Reports of sales of heavy steel melting scrap at as high as $20 per gross ton delivered, are not confirmed, and are incorrect, as the market has not reached that figure. A sale is reported of 1000 tons of selected heavy steel scrap at $19.25 delivered at buyer's mill, and also a sale of 500 tons of low phosphorus melting stock, largely bloom and billet ends at $24 per gross ton delivered.

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$19.00 to $19.25
No. 1 cast, for steel plants	19.00 to 19.50
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	19.00 to 20.00
Compressed steel	14.50 to 15.00
Bundled sheet, sides and ends, f.o.b. consumers, mills, Pittsburgh district	13.50 to 14.00
Bundled sheet stamping	12.00 to 12.50
No. 1 busheling	14.50 to 15.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	23.00 to 24.00
Iron car axles	29.00 to 30.00
Locomotive axles, steel	29.00 to 30.00
Steel car axles	26.00 to 27.00
Railroad malleable	16.00 to 16.50
Machine shop turnings	10.50 to 11.00
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	19.00 to 20.00
Sheet bar crop ends (at origin)	19.00 to 19.50
Heavy steel axle turnings	13.50 to 14.00
Heavy breakable casts	19.50 to 20.00
Cast iron borings	12.50 to 13.00
No. 1 railroad wrought	19.50 to 20.00

The production of beehive coke in the week ended June 28 is estimated at 286,858 net tons, a slight gain over the previous week, but only about 45 per cent. of the output in the corresponding week of 1918, according to the weekly report of the Geological Survey.

Chicago

CHICAGO, July 8.

An important interest which is operating at over 80 per cent of capacity is deriving all its business except 5 or 6 per cent from domestic sources. The signing of peace, however, is expected to release a good volume of foreign orders from now on. There continues to be a steady though gradual increase in activity. The orders and specifications received by the leading interest in June were double the business done in May. All classes of consumers seem to be participating in the current buying movement with the exception of the railroads. Extensive purchases by the shipyards for vessels to be built for foreign accounts are expected.

There has been a general advance of 10 per cent on rivets and 5 per cent on bolts and wire prices are expected to go up soon. Pig iron continues less active than in June, when it is estimated about 150,000 tons were placed in this district. Scrap continues to advance. Mill operation is about the same as heretofore.

Pig Iron.—The volume of business continues smaller than in June. Many melters have made their initial purchases for last half requirements, but as these have been generally conservative, additional orders and contracts are expected to develop later. There is still a moderate amount of activity in the market involving tonnages all the way from carload lots up to 4000 or 5000 tons. Agricultural implement manufacturers are beginning to show interest in iron. The Southern interest, which has been selling on a Chicago base for third quarter, is no longer actively soliciting business on that basis for fourth quarter. However, it is willing to absorb $1 of the freight to Chicago on all grades of foundry iron. Among orders recently placed were 7000 tons of malleable, 1000 tons of foundry and 800 tons of copper bearing low phosphorus. An inquiry for 1000 tons of silvery is before the trade. The leading independent steel interest, which has been selling foundry produced during the period of slack operation this spring, has withdrawn from the market. Copper bearing low phosphorus is said to be available at $39 delivered. An increasing number of melters are contracting for their last half requirements of foundry coke. A few producers, however, have withdrawn from the market in the belief that coke prices will advance.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon, 1.50 second half delivery, f.o.b. furnace, average freight to Chicago $2.50 (other grades subject to usual differentials)	$29.25
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	29.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75 (nominal)	33.00
Southern foundry silicon, 1.75 to 2.25 (nominal)	31.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	40.00
Silvery, 7 per cent	42.05

Ferroalloys.—Ferromanganese and spiegeleisen are inactive but nrm. Small lots of ferrosilicon, 50 per cent, have been sold by producers at $85 delivered, and one sale at as low as $65 is reported to have been made.

We quote 80 per cent ferromanganese at $125, delivered; 50 per cent ferrosilicon, resale, at $85 delivered; spiegeleisen, 18 to 22 per cent, $35, furnace.

Structural Material.—As a result of the activity of the past two months, mills and fabricators are well supplied with work. Although there has been a let-up in awards of large tonnages, a steady stream of smaller projects continues to develop. The Simmons Co., Kenosha, Wis., has let 1200 tons to the Kenwood Bridge Co. The Rock Island Bridge & Iron Works, Rock Island, Ill., will fabricate 1000 tons for a steel barge to be built for the Edward Gillen Dock, Dredge & Construction Co., Racine, Wis. The Lackawanna Bridge Co., which was recently awarded 155 tons for the first unit of the Graham Brothers tractor plant, Evansville, Ind., will also fabricate 150 tons additional for the second unit. The Milwaukee Bridge Co. is the low bidder on 250 tons for a bascule bridge at Manitowoc, Wis. Yavapai County, Ariz., has awarded 177 tons for the Verde River bridge near Cottonwood, Ariz. Other recent lettings include:

International Harvester Co., Deering Plant, Chicago, 234 tons to the Worden-Allen Co.

Defiance Machine Works, Foundry Building, Defiance, Ohio, 207 tons, to the Duffin Iron Works.

Remodeling of Pabst Brewery, Milwaukee, 300 tons, to Worden-Allen Co.

Prominent among recent inquiries is one put out by the Leonard Construction Co., Chicago, calling for 1800 tons for tanks, agitators and stills and 475 tons for a 500,000 cu. ft. gas holder, to be built for the Beacon Oil Co., Everett, Mass. Other inquiries are as follows:

Forge Shop, Whitman & Barnes Mfg. Co., West Pullman, Ill., 500 tons, Stone & Webster Engineering Corporation, general contractor.

Blackstone Theatre, South Bend, Ind., 185 tons, Henry L. Newhouse, Chicago, architect.

Missouri Pacific Railroad, St. Louis, 120 tons, for bridge spans.

Astor Hotel, Astor and Juneau streets, Milwaukee, Wis., 400 tons. Plans to be out this week.

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Bars.—All the bar iron mills except one have raised their quotations to 2.35c., Pittsburgh, or 2.62c., Chicago. The one which has not advanced is expected to make a similar advance soon. The demand for bar iron continues light. There is a steady improvement, on the other hand, in soft steel business. Agricultural implement manufacturers are contracting for last half requirements and placing some generous orders for immediate shipment. Purchases of bars for reinforced concrete work are increasing and an encouraging volume of business is coming from jobbers and miscellaneous manufacturers. Mill operation is decidedly improved, in some instances being as high as 100 per cent of capacity. The rail carbon situation is also better. One mill expects to go on double turn within a few weeks with prospects of continuing on that basis the remainder of the year. Another mill which has operated only six weeks this year resumed operation yesterday with considerable work ahead. The expanding demand for hard steel bars, like that for mild steel bars, is due in part to the increasing amount of reinforced concrete construction.

Mill prices are: Mild steel bars, 2.35c. Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50c. to 2.62c. Chicago, rail carbon, 2.45c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Plates.—The leading interest has booked orders for about 2000 tons of plates and 1000 tons of shapes for a ship to be built in a Puget Sound yard, and recently received specifications for steel for two ships involving 4800 tons of plates and 3000 tons of structural material. An increased demand from shipbuilders is expected, particularly in connection with vessels built for foreign interests. Seven or eight ships which are to be constructed on builders' account in the North Pacific Coast district are believed to be intended for delivery abroad. Of these vessels, four are reported to have been started. The leading independent has sufficient business on its books to insure operation for three months. The foremost interest with a much larger capacity is not so well off.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Sheets.—The leading independent has sufficient business booked to keep its mills operating for four months and is accepting no new orders except for delivery in and after October. Demand is still good and comes from many sources. The Republic Iron & Steel Co. closed its

sheet plant at Niles, Ohio, on July 1 to install motors which will enable it to operate each department separately. The mill will be closed for a month or two.

Mill quotations are 4.35c. for No. 28 black, 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c. and No. 28 galvanized, 6.72c.

Wire Products.—Manufacturers believe that the deferred buying movement now in full swing will continue throughout the summer and that the customary lull between the spring and fall seasons will not take place this year. Not only are buyers covering for future requirements but they are specifying and ordering heavily for immediate shipment. Among recent orders was one for 500 tons of wire nails. For mill prices, see Finished Iron and Steel f.o.b. Pittsburgh, page 133.

Rails and Track Supplies.—There is little activity on track fastenings. The railroads buy only when they must and then generally ask for the earliest possible delivery.

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.75c. f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Cast-Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. is low bidder on 940 tons to be purchased by Chicago. Current inquiries include the following:

Springfield, Ill., 1200 tons of 6-in. and 24-in. Bids in July 7.

Hamilton, Ohio, 140 tons, 4 and 6-in. Bids to be in July 10.

Great Falls, Mont., 150 tons, 6-in. and 12-in. Bids to be in July 15.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in. $54.80; 6-in. and larger, $51.80; class A and gas pipe, $1 extra.

Old Material.—The rising tendency of the market is reflected in additional advances in some items. Consumers are showing increased interest in heavy melting steel and cast-iron scrap, but are slow in covering their requirements, apparently not being willing to pay the prices asked. Dealers, on the other hand, are not overanxious to sell, as they are confident that higher prices are forthcoming. The Ordnance Department of the Army is asking for bids to-day on 100 tons of gray iron and malleable castings, and on July 14 will receive tenders on 266 tons of shell billets. The Wabash, Great Northern and Union Pacific are offering about 2000 tons of scrap apiece. The Grand Trunk and the Santa Fé have issued lists of 1000 tons each and the Soo Line a list of approximately 800 tons.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$22.00 to $23.00
Relaying rails	35.00 to 45.00
Carwheels	22.50 to 23.50
Steel rails, rerolling	22.50 to 23.00
Steel rails, less than 3 ft.	20.50 to 21.00
Heavy melting steel	18.00 to 19.00
Frogs, switches and guards cut apart	18.00 to 19.00
Shoveling steel	18.00 to 18.50

Per Net Ton

Iron angles and splice bars	$20.00 to $21.00
Steel angle bars	17.50 to 18.00
Iron arch bars and transoms	23.00 to 24.00
Iron car axles	28.50 to 29.50
Steel car axles	25.50 to 26.00
No. 1 busheling	16.00 to 16.50
No. 2 busheling	11.50 to 12.00
Cut forge	16.75 to 17.25
Pipes and flues	14.00 to 14.50
No. 1 railroad wrought	17.00 to 18.00
No. 2 railroad wrought	16.50 to 17.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	20.50 to 21.00
No. 1 cast	22.00 to 23.00
Boiler punchings	19.50 to 20.00
Locomtive tires, smooth	19.50 to 20.00
Machine shop turnings	7.50 to 8.00
Cast borings	10.50 to 11.50
Stove plate and light cast	17.50 to 18.50
Grate bars	17.00 to 17.50
Brake shoes	16.00 to 17.00
Railroad malleable	17.00 to 18.00
Agricultural malleable	16.50 to 17.00
Country mixed	13.00 to 14.00

Bolts and Nuts.—The advance effective July 1 affected only bolts and rivets, the prices of nuts remaining the same. Rivets were raised 10 per cent and bolts 5 per cent. The change in prices has not checked the buying movement. Most makers are adhering strictly to quotations, but some sales are reported to have been made on a Chicago basis, waiving the freight from Pittsburgh. There has been no change as yet in jobbers' quotations. Jobbers quote:

Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ⅞ x 4 in., 50 and 10 per cent off; larger sizes, 40 and 10 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 40 off; hot pressed nuts, square tapped and hexagon tapped, $2 off; coach or lag screws, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are cancelled.

Philadelphia

PHILADELPHIA, July 8.

Lower prices are being made on some grades of pig iron. Foundry iron, 2.25 to 2.75 per cent silicon, is obtainable at $28.60, delivered Philadelphia; malleable has been sold at a price equivalent to $28.35, delivered here, a decline of $2.80 from the last reported transactions, and a maker of standard low phosphorus iron is now quoting $35 f.o.b. furnace, a reduction of $3 a ton. Despite these price concessions, the undertone of the iron market is fairly strong.

No marked change in the steel situation has taken place since last week, this being due in all probability to the double holiday at the end of the week, which cut down bookings of new business. One of the largest inquiries of the week comes from the Ford Motor Co., Detroit, for 10,000 tons of cold-rolled screw stock for delivery over six months or a year. A Pittsburgh maker is reported to have made a concession of $2 a ton to get this business.

The scrap market continues surprisingly strong in view of the small amount of buying. An Eastern plant has paid $19 for No. 1 heavy melting steel and all other grades are moving up in sympathy, even foundry and rolling mill scrap, for which there is very little demand.

Pig Iron.—New price levels are being established in this district on foundry, malleable and low phosphorus pig iron. No. 2 X iron is obtainable at $28.60, delivered Philadelphia, but a large proportion of the current business is being placed at $29, delivered, or higher, in some cases above $30 for this grade. About 1000 tons of malleable iron was purchased last week by a nearby consumer from an eastern Pennsylvania furnace at a price equivalent to $28.35, delivered Philadelphia. Last reported sales were on the basis of $31.15, delivered. A leading maker of standard low phosphorus iron is now quoting $35, f.o.b. furnace, for the base grade, 0.04 in phosphorus, and to meet this price makers of copper bearing iron will doubtless have to make a lower price, their present quotation being $35. There is a fair demand for foundry iron both for prompt delivery and for shipment over the rest of the year, but the volume of business being booked is considerably below that of a few weeks ago. Differentials between grades of foundry iron differ considerably. For example, one Lehigh Valley maker quotes $28.50, furnace, for No. 2 plain and $29, furnace, for No. 2 X, a differential of only 50c., while another furnace in the same locality quotes $28, furnace, for No. 2 plain and $29.25, furnace, for No. 2 X, a differential of $1.25. Some of the recent low-priced sellers are dropping out of the market or raising prices. A Buffalo company which has sold No. 2 X as low as $25, furnace, has raised its prices and another seller of eastern Pennsylvania foundry has dropped out of the market for the present. In some cases, high prices are being gotten for well-known brands of iron. For example, a small tonnage of Buffalo No. 1 foundry iron was sold here at a delivered price of $33.65. One of the largest inquiries comes from the Bethlehem Steel Co., which wants 5000 tons of foundry iron, 2.25 to 2.75 per cent silicon and 1.00 to 1.50 per cent manganese, for Sparrows Point, Md., deliveries September to December, inclusive. There are other inquiries for 500 and 1000-ton lots. Some railroad inquiry has appeared, the Pennsylvania asking for bids on 800 tons of charcoal iron and the Baltimore & Ohio is asking for a small tonnage of high-manganese

iron. Two inquiries for low phosphorus iron total 2000 tons. No further sales of basic iron are reported, but quotations are obtainable at $26, Eastern furnace. The Alan Wood Iron & Steel Co. will soon blow in a Swede furnace on foundry iron. The Princess furnace is getting ready to blow in about July 15. The Robesonia furnace blew in this week on foundry iron. The Leesport furnace will make about 2000 tons of foundry iron and then will go on ferromanganese. We quote standard grades of iron for delivery in Philadelphia or vicinity as follows, except that low phosphorus grades are quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$28.60 to $30.60
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	28.10 to 30.10
Virginia No. 2 X (2.25 to 2.75 sil.)	30.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	29.60
Basic	$26.00 to 26.50
Gray forge	25.50 to 26.00
Malleable	28.35
Standard low phosphorus (f.o.b. furnace)	35.00
Copper bearing low phosphorus (f.o.b. furnace)	35.00

Ferroalloys.—Producers are still asking $125, delivered, for 78 to 82 per cent ferromanganese, but a brokerage firm is reported to have sold 300 tons for fourth-quarter delivery in the Pittsburgh district at $110. All of the British makers have now reduced their asking price to $115, Atlantic seaboard. There are inquiries in the market from England for a total of about 3000 tons of spiegeleisen, but the domestic market is quiet, with prices ranging from $30 to $35, furnace, for the 18 to 22 per cent. Shipment was recently made of a small tonnage of spiegeleisen to Genoa, Italy.

Coke.—Some makers of foundry coke outside of the Connellsville district have advanced their prices to $5.50, while $5.25 is being asked here for Connellsville bee hive coke and Eastern by-product coke. Furnace coke for August shipment has been offered at $4, Connellsville, while $4.25 is asked for September delivery. A consumer has bought 6000 tons of Virginia foundry coke for delivery over the rest of the year. Some makers of Virginia coke have advanced their prices to $7.50, the minimum now quoted being $6.50.

Semi-Finished Material.—There is comparatively little inquiry for billets. Prices remain firm at $42.50, Philadelphia, for 4 x 4 in. open-hearth rerolling billets. Forging billets are quoted at $55 and slabs at $45, delivered Philadelphia or nearby.

Plates.—Monday's mail brought one Eastern plate manufacturer a fair number of orders of a few hundred tons each, but generally the plate market is exceedingly dull and sellers are wondering where the tonnage is coming from to fill up the large plate-producing capacity of this district. Some mills are operating at from 25 to 40 per cent of capacity. The demand for universal plates is somewhat better than for sheared plates. A Philadelphia export company recently effected delivery of 300 tons of plates in England within two weeks from the date the order was received, and has been awarded another quick-shipment order of 2000 tons. The business came to this country because of the short delivery rather than on account of price, which on a c.i.f. basis was about equal to the British price. There seems to be less tendency to cut prices, but it is reported that a large tonnage recently placed by a shipbuilding company went at 2.50c., Pittsburgh. We quote sheared plate ¼-in. and heavier, at 2.895c., Philadelphia.

Structural Material.—Building construction in Philadelphia and vicinity has not yet taken the spurt which is in evidence in some other large cities, but there are several large projects pending which may come into the market soon. One of these is a new office building for the Fidelity Trust Building in Broad Street, near Sansom Street, which will take 10,000 tons or more of steel, and the Public Ledger building, soon to be let, will take about an equal tonnage. It is reported that Sears, Roebuck & Co., the Chicago mail order concern, will build a large steel warehouse in or near Philadelphia. Prices of plain material are quite firm. A fabricator has been assured by a large steel company which supplies its wants that the price will not fall below 2.45c., Pittsburgh, this year. We quote plain material at 2.695c., Philadelphia.

Bars.—A leading manufacturer of steel bars reports that its mills are now operating at 100 per cent and its deliveries on different sizes range from three to eight weeks. The Ford Motor Co., Detroit, has inquired for 10,000 tons of cold rolled screw stock, deliveries over six months or a year, on which a Pittsburgh mill is reported to have quoted a discount of 30 per cent, equivalent to $2 a ton below the schedule adopted as of March 21, last. Demand for bar iron is not very active. Two of the leading Eastern mills, which have been out of the market for several weeks on account of labor strikes, are taking no business and will not do so until the end of the controversy is in sight. The Reading Iron Co., Reading, Pa., on July 7 announced a reduction in wages to puddlers of from $14.57½ to $10.50 a ton, this being $1.25 a ton higher than the rate which the Bethlehem Steel Co. and the Lebanon Valley Iron & Steel Co. recently offered its puddlers, the offer being refused and strikes resulting. We quote soft steel bars and bar iron at 2.595c., Philadelphia, with double refined bar iron 1c. a lb. higher.

Rails.—Several sales of rails in lots of a few hundred tons each have been made within the past week by a leading Eastern producer at $47 for open hearth, f.o.b. mill.

Wire Products.—The demand for wire products continues good. A Western Pennsylvania wire mill is now quoting six to eight weeks deliveries. There is talk of higher prices. For quotations see page 133.

Old Material.—The scrap market continues to be largely a dealers' affair, but some buying is being done. An Eastern steel plant last week bought a small tonnage of No. 1 heavy melting steel at $19, delivered, but this price has been offered by another mill and refused by dealers. The high prices quoted by both dealers and consumers on Government scrap offer a guide to the views of the trade as to what prices will ultimately be quoted should several consumers come into the market for good-sized tonnages. On 12,000 tons of billets which the Government sold at Rochester, N. Y., last week as scrap the high bid was $19.19 f.o.b. shipping point. Dealers here are offering $18 to $19 for No. 1 heavy melting steel without being able to pick up more than carload lots. With basic pig iron at $26 in this market, some dealers predict $25 as the eventual price for No. 1 heavy melting steel. Sales of heavy turnings have been made at $14.50 and $15, delievered, No. 1 railroad wrought is quoted at $24 to $25 and No. 1 cast at $23 to $24. Dealers regard the prices below as minimum and firmly believe that any buying activity will advance all prices at least $2 or $3 a ton. We quote for delivery at consumers' works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel	$19.00 to $20.00
Steel rails, rerolling	19.00 to 20.00
No. 1 low phosphorus, heavy, 0.04 and under	23.00 to 24.00
Carwheels	23.00 to 24.00
No. 1 railroad wrought	24.00 to 25.00
No. 1 yard wrought	21.50 to 22.50
No. 1 forge fire	13.50 to 14.00
Bundled skeleton	13.50 to 14.00
No. 1 busheling	16.00 to 17.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	12.50 to 13.50
Mixed borings and turnings (for blast furnace use)	12.00 to 12.50
Machine-shop turnings (for rolling mill and steel works use)	13.00 to 13.50
Heavy axle turnings (or equivalent)	14.50 to 15.00
Cast borings (clean)	13.50 to 14.50
No. 1 cast	22.00 to 23.00
Grate bars	18.00 to 19.00
Stove plate	18.00 to 19.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.50 to 19.50
Ungraded pipe	13.00 to 14.00

Bolts, Nuts and Rivets.—Some makers have advanced prices of bolts and nuts 5 per cent, the new discounts being as follows: Carriage bolts, ⅜ x 6-in.,

rolled threads, 60 per cent off; cut thread, 50 and 10 per cent off; larger and longer, 45 and 5 per cent off; small machine bolts, ⅜ x 4 in., smaller and shorter, rolled threads, 60 and 10 per cent off; cut thread, 60 per cent off; larger and longer, 50 and 5 per cent off; lag screws, 65 per cent off; nuts, square and hexagon blank, $3.10 off list; tapped, $2.85 off list. These prices are effective as of July 2, and are f.o.b. Pittsburgh. A Philadelphia shipbuilding company last week bought 300,000 bolts and received a concession in price, an extra being waived.

Cincinnati

CINCINNATI, July 8—(*By Wire*)

Pig Iron.—The Southern price situation is clearing and nearly all furnaces in the Birmingham district are now closer to the last schedule price of $26.75 for 1.75 to 2.25 silicon, and some sales have been made at this figure to melters in Southern territory. Producers who were willing to take business last week at $24.50 have now advanced to $25.00 and higher, although the usual differentials are not strictly observed, as these same interests will accept business for 2.25 to 2.75 silicon at $25.50 Birmingham basis, which is an advance of only 50c. a ton. Northern iron is also firmer and is being held at $26.75 Ironton, based on the usual No. 2 Northern foundry analysis of 1.75 to 2.25 silicon. A number of sales have been made within the past few days in southern Ohio that range all the way from carload lots to 3000 tons, all for this year's shipment, and it is understood that most of this iron was booked at the regular market price. Northern furnaces are fairly well sold up for this year and are inclined to hold their free tonnage until a later date before disposing of it. Southern furnaces are in the same position and some producers in the South will not sell any more iron except for third quarter shipment, and not much iron for this delivery is left. There is an absence of any interest here in steel-making irons, but it is believed that melters in this territory have enough iron contracted for to carry them through the year. All Jackson County, Ohio, silvery furnaces closed down July 7 on account of labor troubles. These furnaces already had preparations under way to blow out for relining and other repairs, as they have been operating under high pressure for some time past.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25 (base price)	$28.60 to $29.10
Southern coke, silicon, 2.25 to 2.75 (No. 2 soft)	29.10 to 29.60
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	28.55
Basic, Northern	27.55
Standard Southern carwheel	51.60
Malleable	29.05
Lake Superior charcoal	$32.35 to 33.35

Coke.—Wise County producers are advancing prices and furnace coke is now quoted in that field around $6 per net ton at oven. One of the leading producers asks $7.50 for foundry coke, but some can still be bought for prompt shipment at $6.50 to $6.75. New River foundry grades range from $7.50 to $8. In the Connellsville field furnace coke, especially, is very much firmer, and while some might be purchased at $4.25 for nearby shipment, the contract price on most standard grades is $4.50. There is some business being done in both furnace and foundry coke, but no contracts call for shipment beyond Dec. 31.

Finished Material.—The jobbers state that mill shipments are slowing down, and mill selling agencies report specifications as coming in at a more rapid rate. Steel pipe is in good demand and there is also a better call for structural material of all kinds. Wire nails are still quoted by jobbers at $3.75 per keg base, and while there is some improvement noted in the number of purchases made, it is noticeable that these are for smaller quantities than usual. Automobile manufacturers are buying large quantities of sheets, and there is also an improved demand on the nearby mills for galvanized sheets. Cold-rolled shafting is holding its own and jobbers are quoting a discount of 5 per cent off list on outside shipments. The call for hoops and bands is only moderately good.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, $3.75 per keg base.

High-Speed Steel.—The recent reduction of 10c per lb., making the price $1.50, has not brought out any new business, and purchases made now by users of high-speed steel are mostly to fill their immediate requirements. Manufacturers do not seem to be willing to contract very far ahead.

Old Material.—There has been a general advance of 25c. per ton on all kinds of scrap with the exception of cast borings and steel turnings, both of which have been marked up 50c. per ton. There is a good demand for both borings and turnings. The steel mills are taking scrap due them on contracts, and it is also reported that some consumers in the Pittsburgh district are planning to place some additional contracts within the very near future. Foundry scrap for nearby shipment is being bought freely, but melters of this kind of scrap are slow about making any future shipment contracts. The following are dealers' buying prices f.o.b. at yards, in carload lots, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet	$11.25 to $11.75
Old iron rails	22.75 to 23.25
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	18.75 to 19.25
Heavy melting steel	14.75 to 15.25
Steel rails for melting	14.75 to 15.25
Old carwheels	18.75 to 19.25
No. 1 railroad wrought	16.50 to 17.00

Per Net Ton

Cast borings	$7.50 to $8.00
Steel turnings	6.50 to 7.00
Railroad cast	19.00 to 19.50
No. 1 machinery	20.25 to 20.75
Burnt scrap	12.00 to 12.50
Iron axles	24.00 to 25.00
Locomotive tires (smooth inside)	14.50 to 15.00
Pipes and flues	13.00 to 13.50
Malleable cast	13.75 to 14.25
Railroad tank and sheet	10.25 to 10.75

Buffalo

BUFFALO, July 7.

Pig Iron.—The market has resolved itself into a steady, even flow of small and moderate tonnage business, the rush of heavy tonnage orders being over for the time being, with the order books of the various furnace interests filled up for the third quarter, and nearly filled for the fourth quarter, making a highly satisfactory situation for producers. One large interest in the Buffalo district, on account of heavy sales, has withdrawn from the market, and others are fast approaching a condition of a filled-up order book for the period to the end of the year and are, in consequence, assuming a waiting attitude with reference to the taking on of business for next year, being strongly of the belief that higher prices will prevail for the first half of 1920. They see a very cheerful aspect to the outlook. One Buffalo furnace interest reports sales of 1000 tons of basic and 2000 tons foundry for the week at the March 21 schedule, all that it cared to take on. Another interest, which has had two of its furnaces out of blast for several weeks, has put one of them back into operation and plans to resume operation of the other within 10 days, making its full quota of four stacks. Shipments of pig iron are going forward from furnaces at a very satisfactory rate. The demand for foundry coke has been active and the tonnage booked for the past week has been exceedingly heavy; a large number of foundries covering their needs to July 1, 1920, on what seems to be a very favorable basis considering the shortage of labor in the Connellsville coke fields and the possibility of this labor

situation becoming more acute later in the year. We quote f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon	$29.75
No. 2X, 2.25 to 2.75 silicon	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon	$26.25 to 27.00
Gray forge	25.75 to 26.00
Malleable, silicon not over 2.25	27.25
Basic	25.75
Basic, 1 to 1½ per cent manganese	26.25
Basic, 1½ to 2½ per cent manganese	26.75
Bessemer	27.95
Lake Superior charcoal, regular grades, f.o.b. Buffalo	32.35

Finished Iron and Steel.—The week has shown increased orders in hot-rolled material and structural material, also good demand for corrugated bar material, but the greatest activity has been in wire and wire products. One local wire mill reports more current quarter orders for wire rods and wire nails than it can handle, notwithstanding it is operating night and day shifts. It is out of the market on these commodities for third quarter business and has stopped soliciting for fourth quarter. The Canadian trade situation is better than it has been at any time in recent months. The Lackawanna Bridge Co., Buffalo, has received the contract for 200 tons of fabricated steel for plant extension of the J. P. Devine Co., Buffalo; the Ferguson Steel & Iron Co., Buffalo, has the contract for an addition to power house at the plant of the Pierce-Arrow Motor Car Co., Buffalo, requiring 200 tons of structural steel and the Buffalo Structural Steel Co. has received the contract for the fabrication and erection of 150 tons of steel for service station at the Atterbury Motor Co.'s plant, Buffalo.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28 galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Old Material.—Although the demand for heavy melting steel from local consumers continues to be light, there is strong inquiry from eastern Pennsylvania mills and considerable business has come to this market from that territory. Prices for this commodity are advancing. It is difficult to obtain in good sized tonnages and no such tonnages have been sold. Dealers' stocks are low in this as well as in other lines of scrap, and dealers are predicting there is a likelihood of a real shortage developing in many lines. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades	$17.50 to $18.50
Low phosphorus, 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	20.00 to 20.50
No. 1 machinery cast	22.50 to 23.00
Iron axles	26.00 to 27.00
Steel axles	26.00 to 27.00
Carwheels	22.50 to 23.50
Railroad malleable	19.00 to 20.00
Machine shop turnings	8.00 to 9.00
Heavy axle turnings	13.00 to 14.00
Clean cast borings	11.50 to 12.50
Iron rails	23.00 to 24.00
Locomotive grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Wrought pipe	15.00 to 16.00
No. 1 busheling	14.00 to 15.00
Bundled sheet stamping	12.00 to 13.00

Birmingham

BIRMINGHAM, ALA., July 7.

Pig Iron.—Fourth quarter pig iron is up $1 per ton on the average with two interests standing for the Redfield price, $26.75, or even over. As showing the status of the market, this might be mentioned: A sale of 3000 to 4000 tons 2.25 to 2.75 silicon was made at $26.25 by agent. This is $1 higher than recent quotations. The agent's booking was turned down by the central office. A leading producer, who has kept out of the low-priced market, announces $26.75 for 1.75 to 2.25 silicon basis without specification as to period of delivery. A large interest declares itself out of the market for fourth quarter until it gets around $27. With some possible exceptions, it is fair to conclude that the minimum now is around $25.75 compared with a recent $24.75. That is the spot local price. One interest is believed to have booked about all the foundry it cares to take for the last half, but is thought to be still in the market and to be selling at what trade conditions such as freight competition permit. The market is strong and the advance bids fair to continue. A feature of the week was inquiry from the East denoting such bookings by Eastern furnaces as to force the Eastern consumers to look southward with a keener interest. The Southern melt is increasing regularly. Car shortage has begun to threaten, although not yet hampering movements beyond trifling delay. Yard stocks have dwindled greatly. The Woodward Iron Co. will blow in another stack during the week, giving it four active ones, and the Republic Iron & Steel Co. will blow in one, giving it two on active list. Northern labor agents are drawing negroes from the Southern industrial field in such numbers as to attract attention and create some anxiety. There is also a shortage of skilled labor at foundries. Wire and nail mills report an active influx of orders, many of them of rush nature. The Gulf States Steel Co. will resume in all departments about July 15, after completion of repairs in some quarters, the blast furnace also resuming on basic. We quote per gross ton f.o.b. Birmingham district furnaces, as follows:

Foundry, 1.75 to 2.25 silicon	$25.75
Basic	24.75

Cast Iron Pipe.—Sanitary pipe shops report demand equal to capacity of operations with available supply of skilled labor, or about 60 per cent of maximum, with indications of a considerable period of activity. Other pipe works are approaching similar conditions with the $45 basis more strictly adhered to.

Coal and Coke.—High-grade foundry coke has advanced $1 per ton to $9 with avid demand for the output. Coal in large quantities is moving down the Warrior to Mobile and New Orleans from inland mines since rail and water rate and all-water rate were equalized.

Old Material.—The scrap market is stronger. Dealers are inclined to hold for further advances confident they are coming. Consumers have offered advances of $1 and more per ton without creating a selling stampede. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$14.50 to $15.00
No. 1 heavy steel	13.50 to 14.00
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.50 to 8.00
Stove plate	17.00 to 18.00
No. 1 cast	22.00 to 22.50
Car wheels	22.00 to 22.50
Tramcar wheels	21.50 to 22.00
Steel axles	20.00 to 22.00
No. 1 wrought	14.00 to 15.00

St. Louis

ST. LOUIS, July 7.

Pig Iron.—The holiday week, cut to four business days, coming at the close of the first half year with inventory, repair and other problems left little incentive among buyers to render the market at all active. Some small purchases, as is usual at all times, were reported, but nothing of moment in either buying or inquiry came out. Neither was there any development of interest as to the future. Although there is a steady, if slow, improvement in the market, not enough is developing to occasion any striking predictions as to the future. At the same time there is a strong belief that the real turn in the road has been reached and that although the usual mid-summer period is not especially active, there will be good business as soon as the last half is under way. No readjustments of prices have been reported and furnace representatives are generally standing on the figures which have prevailed.

Coke.—No business of consequence appeared during the week in coke, either metallurgical or domestic, and contracts for the last half on the part of those whose contracts expired with the end of June have been pretty well placed, almost entirely on the basis of renewals of old transactions.

Finished Iron and Steel.—Finished products have been rather quiet during the week, though the volume

of buying is slowly but surely increasing as contractors and others see work coming ahead of them. However, the volume is still below normal, with no immediate indication of a change other than the slow progress which has been made. No contracts for quantities are being made and immediate needs are, as usual, being filled from warehouse. For stock out of warehouse, we quote as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—The scrap market seems to show a softening tendency, but there has been no marked change in quotations. The buying and selling continues to be mostly among the dealers and even they are getting a bit more cautious as to their transactions, inasmuch as the consumers are still out of the market. The National Enameling & Stamping Co., having filled its needs, has withdrawn and none of the other consumers is disposed to do any buying. We quote dealers' prices f.o.b. St. Louis industrial district customers' works as follows:

	Per Gross Ton	
Old iron rails	$22.50 to	$23.00
Old steel rails, rerolling	19.50 to	20.00
Old steel rails, less than 3 ft.	17.50 to	18.00
Relaying rails, standard sections, subject to inspection	34.00 to	37.00
Old carwheels	23.50 to	24.00
No. 1 railroad heavy melting steel	17.50 to	18.00
Heavy shoveling steel	14.50 to	15.50
Ordinary shoveling steel	13.50 to	14.00
Frogs, switches and guards, cut apart	18.00 to	18.50
Ordinary bundled sheets	10.00 to	10.50
Heavy axle and tire turnings	12.50 to	13.00
	Per Net Ton	
Iron angle bars	$16.50 to	$17.00
Steel angle bars	15.50 to	16.00
Iron car axles	30.00 to	30.50
Steel car axles	29.00 to	29.50
Wrought arch bars and transoms	21.00 to	21.50
No. 1 railroad wrought	16.50 to	17.00
No. 2 railroad wrought	15.75 to	16.25
Railroad springs	15.50 to	16.00
Steel couplers and knuckles	15.50 to	16.00
Locomotive tires, 42 in. and over, smooth inside	17.00 to	17.50
No. 1 dealers' forge	12.50 to	13.00
Cast iron borings	9.50 to	10.00
No. 1 busheling	15.00 to	15.50
No. 1 boiler cut to sheets and rings	14.00 to	14.50
No. 1 railroad cast	21.50 to	22.00
Stove plate and light cast	16.00 to	16.50
Railroad malleable	15.00 to	15.50
Agricultural malleable	14.00 to	14.50
Pipes and flues	14.00 to	14.50
Heavy railroad sheet and tank	13.50 to	14.00
Railroad grate bars	15.00 to	15.50
Machine shop turnings	9.00 to	9.50
Country mixed	13.50 to	14.00
Uncut railroad mixed	15.00 to	15.50
Horseshoes	18.50 to	19.00

New York

NEW YORK, July 8.

Pig Iron.—The first buying of pig iron for delivery in 1920 was 1200 tons of basic by the Stanley Works, New Britain, Conn. It is understood that the order was placed with an eastern Pennsylvania furnace at about $26.50, furnace. A consumer in upper New England has purchased 500 tons of foundry iron for delivery the first half of next year on the basis of $28 for No. 2X, Buffalo, which is the so-called Redfield quotation, it being the price suggested to the Industrial Board last March. This limited buying for next year does not indicate, however, that consumers are fully covered for the last half of this year, as it is known that many of them will have to buy freely to cover their needs up to Jan. 1. Some buyers have placed orders for last quarter delivery, but do not expect to use the iron until the first quarter of 1920. Much irregularity in prices still exists. One furnace in eastern Pennsylvania, which has sold No. 2X at $30, furnace, or $31.80, New York, has now advanced its quotation 50c., but the quotation of $28, furnace, has not yet disappeared. Very little actual business is being done in selling for export, but the outlook is regarded as more favorable. We quote as follows, delivered New York, for Northern and Southern grades, quotations on the latter being nominal:

No. 1 foundry, silicon, 2.75 to 3.25	$31.55 to $31.80
No. 2 X, silicon, 2.25 to 2.75	29.80 to 30.80
No. 2 plain, silicon, 1.75 to 2.25	28.55 to 29.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	31.40 to 31.90
No. 1 Southern, silicon, 2.75 to 3.25	32.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75	30.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	29.45

Ferroalloys.—There is very little demand for ferromanganese and while American producers are reported to be generally asking $125, delivered, it is believed that as low as $115 and possibly $110 could easily be done on an attractive order. It is stated, however, that $110 has been refused by one or two sellers. The British price is unchanged at $115, seaboard. There is an inquiry for 500 tons for export. The recent heavy buying is believed to have satisfied all needs for the present. The spiegeleisen market is regarded as considerably stronger but there has been very little demand to test this statement. Quotations are nominal at $30 to $35, furnace, for 18 to 22 per cent alloy. The 50 per cent ferrosilicon market is unchanged at $75 to $80 per ton, delivered. Sales are confined to carload lots.

Finished Iron and Steel.—Building activities in the East continue to show progress, but there is no sign as yet of a boom. The largest steel building placed in New York since the coming of peace is the Cunard Building, in lower Broadway, taking 11,000 tons, which will be rolled and fabricated by the American Bridge Co. Post & McCord have been awarded the building contract by Irons & Todd, the general contractors. Other building jobs reported are as follows: A silk mill at Reading, Pa., 400 tons, to L. F. Shoemaker & Co.; a bridge for the Southern Railway, 200 tons, to the Virginia Bridge & Iron Co., Roanoke, Va.; two radio towers at San Francisco for the Navy Department, 300 tons, to the Pittsburgh-Des Moines Steel Co., Pittsburgh; 400 tons of tank work in Texas for the Standard Oil Co., to parties unannounced; extension to crane runways at Brooklyn Navy Yard, 3500 tons, McClintic-Marshall Co. Projects which are up for bids include a hospital at Orange, N. J., taking 200 tons; a bridge for the Norfolk & Southern Railroad, 350 tons; a Philadelphia theater, 300 tons. Bids for a storage shed at the League Island Navy Yard, Philadelphia, have been rejected because Navy Department officials found that no appropriation had been made. The plate market is exceedingly dull and weak despite the appearance of export inquiries from Japan totalling 30,000 to 40,000 tons. A Middle Western mill is reported to have offered an Eastern warehouse 3000 tons of plates for stock at 2.50c., Pittsburgh. There is a good demand for bars, and mills are quoting several weeks delivery on some sizes. Bolts and nuts have been advanced by several makers. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Warehouse Business.—June sales show on an average an increment somewhat short of the 20 per cent general increase booked in May over the preceding month. Jobbers are reported to be buying freely, but for the most part in small lots to keep stocks up in anticipation of a pick-up in buying. Consumers still refrain from forward buying. The local trade in galvanized sheets still lacks uniformity, one group having adopted a scale on No. 28 of from 6.70c. to 6.45c., but others still adhere to 6.50c. base, with 6.25c. the minimum for desirable business. We quote other out-of-store prices: No. 10 blue annealed sheets, 4.57c.; No. 28 black sheets, 5.37c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands 3-16 in., No. 10 and 12, 4.07c.; shafting, net list.

Cast-Iron Pipe.—The market is extremely dull and no business of importance either municipal or from private sources has appeared. We quote New York prices as follows: 6-in. and heavier, $50; 4-in., $53; 3-in., $60, and $1 additional for class A and gas pipe.

Old Material.—Transactions involve only small tonnages, though the market is strengthening continually. Heavy melting steel, borings and turnings and cast scrap seem to be in most demand. As an example of

the confidence in future higher prices, one dealer with 3000 tons of steel ready for the market, who stated several weeks ago that he would sell the entire amount when he could get $16, is now holding for the market to touch $20. Advances in cast scrap are especially marked, nearby foundries having paid as much as $25, delivered. Dealers and brokers' buying prices, New York, follow:

Heavy melting steel	$15.00 to $15.50
Rerolling rails	17.00 to 17.50
Relaying rails, nominal	40.00 to 41.00
Steel car axles	23.00 to 24.00
Iron car axles	27.00 to 28.00
No. 1 railroad wrought	20.50 to 21.00
Wrought iron track	15.50 to 16.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	18.00 to 18.50
Light iron	6.00 to 7.00
Cast borings (clean)	10.00 to 10.50
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	8.00 to 8.50
Iron and steel pipe (1 in. minimum diameter) not under 2 ft. long	15.00 to 15.50
Stove plate	15.50 to 16.00
Locomotive grate bars	15.50 to 16.00
Malleable cast (railroad)	14.00 to 14.50
Old carwheels	20.00 to 20.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$23.00 to $23.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	21.50 to 22.00
No. 1 heavy cast, not cupola size	16.00 to 16.50
No. 2 cast radiators, cast boilers, etc.	17.50 to 18.00

Cleveland

CLEVELAND, July 7.

Iron Ore.—Ore sales are being made in moderate volume, the demand showing a little improvement over the few preceding weeks. One sale of 60,000 tons is reported and orders for a number of smaller lots were taken during the week. A number of inquiries are pending, but none for round tonnages. Ore shipments showed a good gain in June over May, being 7,980,839 gross tons, as compared with 6,615,341 tons during the previous month. The June movement was 1,841,021 tons less than the corresponding month a year ago. Shipments for the season to July 1 were 16,800,419 tons, a decrease of 2,941,311 tons, as compared with the corresponding period of 1918. July shipments are expected to show a fair gain over June, and shippers state that the movement for the remainder of the season must show considerable increase, or there will not be sufficient ore brought down to last until the next season of navigation. Ore prices delivered f.o.b., lower lake ports, are as follows:

Old range Bessemer, $6.45; old range non-Bessemer, $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55.

Pig Iron.—A fair volume of business is still coming out in foundry and malleable iron, mostly in lots of 500 tons and under. While the market is not nearly as active as a few weeks ago, one Cleveland seller reports sales aggregating 19,000 tons during the week, including 10,000 tons of malleable iron. One lot of 5000 tons of malleable was taken by a Pennsylvania melter for the fourth quarter and first quarter of next year. Another interest is so nearly sold up that it has declined to quote on a number of inquiries. The General Motors Corporation is still in the market for 11,000 tons of foundry and malleable iron for the last half for its Buick plant at Flint, Mich. The American Steel Foundries has bought a round lot of basic iron for its Alliance, Ohio, plant, none of which went to a Cleveland interest. The inquiry from this plant was for 5000 to 6000 tons. The International Harvester Co. has purchased 2500 tons of foundry iron from a Cleveland interest for its Auburn, N. Y., plant to be shipped from a nearby furnace. A central Ohio stove works has been inquiring for 3000 to 4000 tons of foundry iron. The disturbance in the market in central Ohio caused by sales of foundry iron considerably below the market has not disappeared, but a sale of a several hundred ton lot by a Cleveland producer in Springfield at regular prices a few days ago indicates that all low-priced iron may have been sold. While the cut prices were attributed to a Cleveland furnace, local makers are adhering to regular quotations and deny making sales at lower prices. Silvery iron continues fairly active, several sales being made during the week, aggregating 1250 tons. The sale of a small tonnage of Southern iron is reported at $28 Birmingham, for 2.25 to 2.75 silicon. This price is still being shaded somewhat, but apparently not over $1 a ton at present. We quote delivered Cleveland, as follows:

Bessemer	$29.35
Basic	26.15
Northern No. 2 foundry, silicon, 1.75 to 2.25	27.15
Southern foundry, silicon, 2.25 to 2.75	$32.00 to 33.00
Gray forge	26.15
Ohio silvery, silicon, 8 per cent	42.65
Standard low phos., Valley furnace	$38.00 to 40.00

Coke.—The coke market is not very active. Some contracts are being placed for foundry coke for the last half, but many consumers have not yet purchased for that delivery and seem to be in no hurry about contracting. We quote standard Connellsville foundry coke for delivery during the last half at $5.25.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers last week placed in effect a price advance effective July 1. The advance is 5 per cent on bolts, $3 a ton on nuts except on semi-finished nuts, which are unchanged, and about 10 per cent on small rivets. Prices on large rivets are unchanged, but these have stiffened and manufacturers state that they will hereafter adhere to regular prices, on which there has been shading for some time. A large share of bolt and nut consumers are covered with contracts for the third quarter and last half, which were taken at the old prices. Specifications on these contracts are heavy. Manufacturers have been complaining for some time that with increased labor costs there is a small margin of profit left on bolts and nuts at the old prices. Rivet specifications are heavy and manufacturers are still getting a good volume of business in new contracts for the last half. Shipyards are ordering very freely. Prices are as follows:

Large structural and ship rivets	$3.70 base
Large boiler rivets	$3.80
¼ in., 5/16 in. and 7/16 in. diam.	60-10-5 per cent off list
Machine bolts, hp. nuts, ⅝ in. x 4 in.	
Smaller and shorter, rolled threads	60-10 per cent off list
Cut threads	50-10-10 per cent off list
Larger and longer sizes	50-5 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:	
Smaller and shorter	45-10-5 per cent off list
Larger and longer	40-10 per cent off list
Carriage bolts, ⅝ x 6 in.:	
Smaller and shorter, rolled threads	50-10-10 per cent off list
Cut threads	50-10 per cent off list
Larger and longer sizes	45-5 per cent off list
Lag bolts	65 per cent off list
Plow bolts, Nos. 1, 2 and 3	50-10-5 per cent off list
Hot pressed nuts, sq. blank	3.10c. per lb. off list
Hot pressed nuts, hex. blank	3.10c. per lb. off list
Hot pressed nuts, sq. tapped	2.85c. per lb. off list
Hot pressed nuts, hex. tapped	2.85c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	3.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	2.85c. per lb. off list
Semi-finished hex. nuts:	
⅝ in. and larger	70-10 per cent off list
9/16 in. and smaller	80 per cent off list
Stove bolts in packages	75-10-10 per cent off list
Stove bolts in bulk	2½ per cent extra
Tire bolts	60-10-10 per cent off list

The above prices are from July 1, 1919.
All prices carry standard extras, Pittsburgh basis.

Finished Iron and Steel.—Orders for finished and semi-finished steel are heavy and many consumers are still placing contracts for finished steel for their last half requirements. The activity covers practically all lines, but plates, which continue quiet. Plate prices are firmer, but shading apparently has not entirely disappeared. The demand for reinforcing bars is very heavy, and one Pennsylvania mill has advanced its price on hard steel bars $2 a ton to 2.35c. Many orders are coming out for 100 to 200-ton lots, and one for 600 tons has been placed for a Cleveland garage. Structural work is coming out in good volume and fabricators are placing many orders for small lots for stock or specific jobs. The American Bridge Co. has taken from 1000 to 1500 tons for a factory building for the B. F. Goodrich Co., Akron. Inquiries include 470 tons for the Cleveland plant of the Colburn Machine Tool Co., and 130 tons for a foundry building for the American

Malleable Castings Co., Marion. The Wills-Lee Co. is expected to begin buying steel shortly for its new automobile plant near Port Huron, Mich. While plans are not yet out, it is estimated that this plant and those of makers of parts and accessories to be located on the same site will ultimately require a very large tonnage of structural steel. Agricultural implement makers in this territory are very busy, and are specifying heavily for steel bars and specialties. A Pittsburgh mill that has been selling light rails rerolled from hell steel at 2.05c or $7 a ton under the regular price is now quoting the reduced price only on sections heavier than 25 lb. and reports that it has very few of these left. Sheets are in very good demand. Particularly black and blue annealed, and some of the mills are sold up for 60 days. Orders for wire products are heavy. Sheet prices are firmer, but there is still an occasional report of price cutting. The demand for tin plate has also become very active. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.37c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Old Material.—The market is very active and prices have again advanced, being $1 or more higher on nearly all grades. Dealers are scouring the market for material, but little is available. Those having yard stocks are holding them for higher prices, and dealers predict that heavy melting steel will go to $25. The market is entirely a dealers' market, at present, and consumers so far are showing no disposition to pay above $18.50 for steel scrap, the price at which they covered for considerable material about two weeks ago. However, dealers are offering as high as $20 for steel scrap, and sales have been made at $19.25 and $19.40 at producers' plants for this grade. A local producer has sold its output of turnings for three months at $12 at plant. The Cromwell Steel Co., which will shortly resume operations at Lorain, has an inquiry out for 5000 tons of heavy melting steel. We quote delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	$19.50 to $20.00
Steel rails, under 3 ft	21.00 to 22.50
Steel rails, rerolling	21.00 to 22.00
Iron rails	25.00 to 26.00
Iron car axles	31.00 to 33.00
Steel car axles	29.50 to 30.50
Low phosphorus melting scrap	22.50 to 23.00
Cast borings	12.50 to 13.00
Iron and steel turnings and drillings	11.00 to 11.50
Compressed steel	17.00 to 18.00
No. 1 railroad wrought	21.50 to 22.50
Cast iron car wheels	24.00 to 25.00
Agricultural malleable	17.00 to 18.00
Railroad malleable	20.00 to 21.00
Steel axle turnings	16.00 to 17.00
Light bundled sheet scrap	15.00 to 16.00
No. 1 cast	23.50 to 24.50
No. 1 busheling	18.00 to 19.00
Drop forge flashings, 10 in. and under	15.00 to 16.00
Drop forge flashings, over 10 in.	12.50 to 13.00
Railroad grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00

The Vulcan Engineering Sales Co., Chicago, sales agent for Hanna Engineering Works, Mumford Molding Machine Co., Q M S Products and the J. C. Busch Co., has been dissolved as of June 30, 1919, and on and after that date all business formerly done by the Vulcan Engineering Sales Co. as sales agent will be transacted by Hanna Engineering Works.

The Steel & Tube Co. of America is contemplating the erection of a new blast furnace at the South Chicago plant of the Iroquois Iron Co. Freyn, Brassert & Co., engineers, Chicago, are now rebuilding blast furnace No. 3 at the Iroquois plant. This stack will be ready for operation the latter part of this year.

The Republic Iron & Steel Co. will break ground shortly for an addition to its general office building at Youngstown, Ohio. Two stories will also be added, increasing the building to eight stories. The present building was erected when the general offices were removed from Pittsburgh.

JAPAN WANTS SHIP PLATES

Inquiries Total from 30,000 to 40,000 Tons

Spain in the Market for Wheels, Axles and Other Products—Export Trade Showing Gradual Improvement

Japanese inquiries for ship plates now in the market total 30,000 to 40,000 tons. There is one of 20,000 tons, another of 7000 tons and a third of 5400 tons. All of these come from large Japanese shipbuilding companies. An order for 23,000 tons is reported to have been placed for shipment to Japan, but this is not confirmed. Shipment to Japan of 6000 tons bought about two weeks ago is now being made. It has been known for some weeks that Japan has a large shipbuilding program under way, 200 ships having been mentioned as the number to be built. Several hundred thousand tons of steel will probably be required.

Spain is also in the market for various steel products, one inquiry calling for 2000 tons each of ingots, blooms and billets, while other inquiries call for 5000 car axles, 10,000 wheels, spiral bumpers and suspension springs, while still another inquiry in the market is for 4000 wheels.

From France there are inquiries for 3000 to 4000 tons of ship plates and about 5000 tons of standard rails.

A British inquiry for 20,000 tons of basic iron is in a fair way to being closed, according to exporters. American basic can now be delivered in England below $40 a ton by shipping as cotton ballast from Southern ports. The lowest freight rates on pig iron quoted out of New York, so far as reported, are $16 to $17.

Japan is also in the market again for rails, her purchases during the last few weeks having totaled 30,000 tons or more. A sale of 1400 tons of 40-lb. rails for shipment to Tampico, Mexico, has been made.

Export business in steel products has shown steady progress during the past few weeks, and it is expected that Government reports, when compiled, will show that fully 600,000 tons were shipped out of the United States in June, the official figures for May having shown a total of 447,050 tons. A large steel exporting company reports that business so far in July is very satisfactory, South American countries and Japan leading as buyers. As yet, comparatively little European business has been placed in this country, shipping space to Europe being largely taken up with food products.

Prices for Export Firmer

Prices for export show some tendency toward stiffening, particularly on wire products, pipe, bars and other products which have been most in demand. No general advance on wire products has followed the one recently put into effect by a Pittsburgh mill, but it is expected soon. On plates some concessions are being made, a sale of 500 tons having been made at 2.55c., Pittsburgh, for shipment to France. Unusual terms also were made by the seller, who granted a 10-day open account and put up a bond insuring shipment from mill within one week from receipt of order.

There are several export inquiries in the market for railroad cars, but most of these emanate from export companies which apparently have no definite prospects, and some car builders refrain from quoting when they find that no financial arrangements have been made to cover such transactions.

Some independent exporters have been able to obtain slightly lower f.a.s. New York prices on certain steel products by transporting steel from a Buffalo mill via the New York State barge canal. A Philadelphia exporter has effected delivery of 300 tons of plates in England in two weeks from receipt of order, and has

been rewarded with an additional order for 2000 tons, also for prompt shipment. In fact, the business was obtained because of the promise of quick shipment, the price c.i.f. Liverpool being about on a par with the British home price, but British mills could not make the desired delivery.

Further obstacle to doing business with England is presented by the decline in sterling exchange on Tuesday to about 4.47⅝, the previous low record being 4.48 on Sept. 1, 1915.

British Iron and Steel Market

Domestic and Export Pig Iron Demand Heavy—Belgium Buys British Rails

(By Cable)

LONDON, ENGLAND, July 7.

Demand for pig iron is heavy both for domestic consumption and for export. Blast furnaces are working irregularly. Hematite iron is scarce and prices have been advanced 10s, making the quotation for home trade £10 and for export £10 5s.

The iron-ore position is easier, those having control of shipping having diverted steamers to Bilbao. Freights also are falling.

Belgium is reported to have bought 40,000 tons of rails from British makers at about £19 10s c.i.f. Belgian colonies are inquiring for material, and America is after this business.

A Belgian company is reported to have purchased all the machine tools of the United States Army which were in use in France at 1914 prices plus 55 per cent, the buyers receiving three years' credit. Belgian bar iron has been sold here at £18 delivered.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at $4.48 for £1:

	£	s.	d.		£	s.	d.	
Pig iron								
East Coast hematite	10	0	0	to	10	5	0	$44.80 to $45.92
West Coast hematite	9	5	0	to	9	10	0	41.44 to 42.56
Cleveland No. 3 foundry	8	0	0	to	8	5	0	35.84 to 36.96
Cleveland basic	8	5	0	to	8	10	0	36.96 to 38.08
Coke (Durham):								
Furnace	1	19	0		.....			8.74 .....
Foundry	2	4	0		.....			9.86 .....
Ferromanganese	25	0	0		.....			112.00 .....
Billets	14	10	0	to	15	0	0	64.96 to 67.20
Tin plate and sheet bars	13	10	0		.....			60.48 .....
Rails, 60 lb. and upward	15	0	0		.....			67.20 .....
								Cents per lb.
Steel bars	19	0	0		.....			3.80 .....
Large rounds, etc.	17	2	6		.....			3.42 .....
Structural material:								
Beams	16	10	0		.....			3.30 .....
Plates	17	10	0	to	17	15	0	3.50 to 3.55
Plates, boiler	19	5	0		.....			3.85 .....
Bar iron	21	0	0		.....			4.20 .....
Tin plates, 14 x 20, coke 112 sheets, 108 lb., f.o.b. Wales.	1	13	0		.....			$7.39 .....

Heavy Ore Demand—Engineers' Strike Cuts Steel Output—German Competition

LONDON, ENGLAND, June 23.—A large demand for foreign ore has been felt recently and this is largely dominated by the freight situation. With tonnage very scarce the freight rate, Bilbao to Middlesborough, has now risen to 29s 6d which makes the c. i. f. price of rubio fully 58s 6d per ton. This important advance has naturally induced consumers to proceed cautiously and abstain from buying where at all possible. Unless freights come down, hematite makers will have no choice except either to cease production or to advance prices further.

The Cleveland pig-iron market has been quieter recently. There is very little prompt iron to be had, and forward delivery business is affected by the coming holiday period in the North of England and in Scotland. This is frequently a quiet time, consumers waiting to cover their autumn requirements when the holidays are over. The output of foundry iron is still insufficient to meet the demands but the stoppage in steel plants on account of the engineers' strike is releasing certain quantities and consequently making the position a shade easier. In some quarters it is hoped that the authorities will consequently do something towards modifying the existing restrictions on the export of pig-iron. The export trade is being held up at present, which is unfortunate, in view of the big demand. No. 3 Cleveland G. M. B. and No. 4 foundry continue to be quoted at 160s for home consumption while the export price is 5s per ton more. As regards forge iron this is fairly plentiful and can be had at 157s. Owing to the pressure for hematite, the production is unable to satisfy the demand and licenses for shipment are being refused. The nominal price at present for East Coast mixed numbers is 190s for home trade and 195s for export.

Increased costs of production have necessitated a further rise in the price of finished steel while the strike of the engineers for a 44-hr. week is seriously affecting the output on the Tees-side. Several rolling mills are idle and it is reported that if the dispute continues much longer production all round will be brought practically to a standstill. Works, still in operation, are actively engaged on ship-plates for which there is an important demand.

German and Belgian Competition

There appears to be an increasing number of Belgian works anxious to get a footing in the export market and several plants are now offering steel bars and sections, f.o.b. Antwerp, for quick delivery. German competition is also already being felt. A large contract for structural engineering in Holland has been accepted by a German firm on terms considerably below those of the British tender. The business is stated to have been accepted by the German firms at about £20 per ton less than the figure tendered by a leading British company. The price quoted in the German tender for the fabricated structural work to be supplied was actually below the price quoted for the raw material as delivered by the rolling mills in this country. This news however has caused little surprise to those who appreciate the enormous advantages which the low exchange value of the mark affords German exporters. Presumably the German firm will receive payment in florins and make its payments in marks.

Another instance, of which information has come directly, is that of a tank steamer, damaged in collision, which put into a British port for repairs. Owing to the very high rate to be charged, however, the steamer is being patched up sufficiently to go to Holland where the necessary work will be done comparatively cheaply with Dutch labor and German steel.

It is reported that proposals which will mean increased production in British shipbuilding yards are being discussed by employers and trade union leaders in the various industries connected with the shipyards. Both sides have agreed to co-operate in the introduction of systems of payment by results, the employers agreeing not to place any limit on the earnings of workmen so paid, while the trade unions undertake to discountenance restriction of output by their members, and to cancel any rule that limits output.

Increase in Exports to South Africa

WASHINGTON, July 8—Increases in the importation of iron, steel, machinery and hardware into South Africa since the cessation of hostilities are shown in a communication to the Department of Commerce from Vice-Consul Charles J. Pisar at Cape Town. Figures for January and February, 1919, show imports of iron and steel machinery totalling $2,150,000 as against $1,134,000 for the corresponding period in 1918. Imports of hardware totaled $1,655,000 as against $944,000. Imports of motor cars were $577,000 as against $248,000. Value of all imports during the two months' period was $48,449,000 as against $36,618,000 for the corresponding period a year ago. The value of South African exports rose from $22,957,000 to $34,997,000.

The Pittsburgh Open-Hearth Steel Co., Pittsburgh, capitalized at $5,000, has been incorporated at Harrisburg to manufacture ingots, billets, bars, plates, rails, etc. The incorporators are J. H. McCloy, Cecil, Pa.; G. S. McCloy, Ingram, Pa., and others.

IRON AND INDUSTRIAL STOCKS

Transactions Show Strong Revival by Public and Abrupt Check Due to High Money Rates

NEW YORK, July 8.

The activity in the stock market showed a strong revival the past week, and there was a considerable participation in buying by the public. Prices rose sharply until checked by the increase in money rates to 15 per cent late Monday afternoon, sales for that day exceeding the 2,000,000 share mark. Steel company common shares showed substantial net gains for the week: Steel, 5⅛ points; Bethlehem, 7¼; Crucible, 20⅛; Republic, 5½; Lackawanna, 4⅜. The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	44½- 50	Int. Har. pf....	— -120
Allis-Chalm. pf..	95½- 96	Lackaw. Steel ..	86 - 91½
Am. Can com....	61¼- 63	Lake Sup. Corp.	19¾- 20⅞
Am. Can pf....	105 -112	Midvale Steel ..	51⅝- 57¼
Am. Cr. & F. cm.	110½-111¾	Nat-Acme	37¾- 39⅜
Am. Cr. & F. pf.	117¾-118	Nat. E. & St. cm.	79¼- 82½
Am. Loco. cm..	91 - 94⅝	Nat. E. & St. pf.	101⅞-102½
Am. Loco pf...	108¼-109¾	N. Y. Air Brake.	122 -127½
Am. Radiator cm.	— -310	Nova Scotia Steel	84 - 87
Am. Ship. pf...	— - 89½	Pittsb. Steel pf..	97 - 98
Am. Stl. Fdries.	44¼- 47	Pressed Stl. com.	86¼- 89
Bald. Loco com..	109¼-116	Ry. Stl. Spg. com.	92⅛- 97
Beth. Steel com.	87⅞- 99	Ry. St. Spg. pf.	— -108½
Beth. Steel Cl. B.	88⅝ 99⅝	Republic com....	93¼-100⅞
Case, J. I., pf...	— -100	Republic pf. ...	104 -104⅜
Cent. Fdry. com.	26½- 30	Sloss com.	73 - 77
Cent. Fdry. pf..	53 - 65¾	Sloss pf.	— - 97½
Chic. Pneu. Tool	80½- 82	Superior Steel ..	45¼- 47⅜
Colo. Fuel	49¼- 53⅜	Transue-Williams	58 - 58½
Cru. Steel com..	98½-120	Un. Alloy Steel.	52¾- 58⅛
Cru. Steel pf....	101 -105	U. S. Pipe com..	35⅛- 36
Gen. Electric....	165 -168½	U. S. Pipe pf..	72 - 74¾
Gt. N. Ore. Cert.	45½- 49¾	U. S. Steel pf..	109⅝-115⅛
Gulf States Steel	68½- 72⅛	U. S. Steel com..	116⅛-116⅞
Harb.-W., Ref. c.	— -102½	Westingh. Elec..	56½- 58½
Int. Har. com..	145⅛-149⅝		

Dividends

The Central Foundry Co., quarterly, 2 per cent on the first preferred, payable July 2.

The Lukens Steel Co., quarterly, 1 per cent on the common, payable July 15.

The Midvale Steel & Ordnance Co., quarterly, $1, payable Aug. 1.

The Transue & Williams Steel Forging Co., quarterly, $1.25, payable July 20.

The United Alloy Steel Corporation, quarterly, $1, payable July 19.

June Shipments of Lake Ore

Shipments in June of iron ore from the Lake Superior region were 7,980,839 gross tons, as compared with 9,921,860 tons in June, 1918, which was a record for June. The decrease for June, this year, was 1,941,021 tons or 19.56 per cent. The comparative shipments to ports for June and for the season were as follows:

	June, 1918	June, 1919	To July 1, 1918	To July 1, 1919
Escanaba	1,077,871	759,647	1,733,366	1,414,527
Marquette	547,927	296,127	1,053,678	447,876
Ashland	1,137,921	951,287	2,036,068	1,768,292
Superior	2,510,974	1,889,294	4,698,565	3,241,561
Duluth	3,164,296	2,947,651	6,276,139	6,699,038
Two Harbors....	1,482,871	1,136,833	3,151,914	2,437,125
Totals	9,921,860	7,980,839	18,949,730	16,008,419
Decrease, 1919.	281,869	1,941,021	.....	2,941,311

The total for this year to July 1 shows a decrease of 2,941,311 tons or 15.52 per cent as compared with an increase of 1.74 per cent a year ago. The Duluth and Superior percentage this year of the total was 42.76 per cent against 57.91 per cent last year. The Escanaba movement this year was 8.83 per cent of the total compared with 9.15 per cent last year. Marquette's percentage this year was only 2.81 per cent as against 5.56 per cent a year ago.

About 60 representatives of the Buffalo Forge Co., Buffalo, met at the summer home of the treasurer, Henry W. Wendt, Sr., Crescent Beach, Ont., June 25, 26, and 27. The program was previously announced by means of booklets, with a picture of Mr. Wendt's cottage upon the cover. Eighteen speakers were booked.

The British Ferroalloy Market

The following survey of the British ferroalloy market appears in the London *Iron and Coal Trades Review* for June 13:

The demand for ferroalloys is still very quiet, orders for high-speed steel being negligible. Manufacturers in many cases are carrying heavy stocks of high-speed steel, and parcels are being picked up at nearly half the association price. Government stocks are still very heavy and re-sales are preventing a good deal of new business. Alloy steels are more in demand for motor car work, but the volume of business is not great.

With the falling off of manufacture, many makers have not yet used up the margin of alloy stocks which they carried as a safeguard during the war. In some directions these stocks are now showing signs of coming to an end, but users will only buy from hand to mouth at the figures they have been quoted.

With the lessened demand, producers of alloys have competed energetically for new business, and prices have continued to fall. The feeling is that we have now reached somewhere near the limit in this respect, as present production costs prohibit further reductions, and it is tolerably certain that inquiries for certain alloys will tend to harden prices.

Orders have been placed for ferrotungsten at 3s. per lb. and, with Wolfram ore at 30s. per unit, a further fall in price is not to be anticipated.

High carbon ferrochrome is not much in demand, but orders are being placed for refined ferrochrome with low carbon content, chiefly for rustless steel.

The following are current prices of ferroalloys and metals for steel-making. Prices are net, delivered Sheffield steelworks:—

Ferrotungsten—(Low carbon), 75 to 80 per cent., 3s. per lb.

Tungsten metal powder—96 to 98 per cent., 3s. 6d. per lb.

Ferrochrome (5-ton lots)—4 to 6 per cent carbon, £55 per ton, basis 60 per cent, scale 20s. per unit; 6 to 8 per cent carbon, £52 10s. per ton, basis 60 per cent, scale 18s. per unit; 8 to 10 per cent, £51 per ton, basis 60 per cent, scale 18s. per unit.

Ferrochrome—Specially refined, broken in small pieces for crucible steel work. Quantities of 1 ton or over: Max. 2 per cent carbon guar., £119 per ton, basis 60 per cent, scale 37s. 6d. per unit; Max. 1 per cent carbon guar., £130 per ton, basis 60 per cent, scale 50s. per unit; Max. 0.75 per cent carbon guar., £155 per ton, basis 60 per cent, scale 60s. per unit.

Ferrochrome—Carbon-free, 65 to 77 per cent cr., 3s. 6d. per lb., pro rata.

Metallic chromium—98 to 99 per cent purity, per lb. according to quantities.

Metallic manganese—98 to 99 per cent carbon free, 3s. 6d.

Ferrosilicon—45 to 50 per cent, £25 per ton, basis 50 per cent, scale 8s. 6d. per unit.

Ferrovanadium—35 to 40 per cent Va., 24s. 6d. per lb. of Va. cont. in alloy.

Ferromolybdenum—70 to 80 per cent Mo. 14s. 6d. per lb. of Mo. cont. in alloy.

Ferrotitanium—23 to 25 per cent titanium, carbon free, 1s. 6d. per lb. flat price.

Ferrophosphorus—20 to 25 per cent, £27 per ton.

Nickel—In cubes, 98 to 99 per cent purity, £195 per ton.

Cobalt metals—97 per cent, 12s. 6d. per lb.

The Panama Canal Commission, Washington, is soliciting bids on the following items of steel scrap now classified and ready for delivery at the Isthmus: Five hundred tons, No. 1 steel rail; 50 tons No. 2 steel rail; 300 tons No. 1 cast steel; 3150 tons No. 1 heavy melting steel, and 1500 tons No. 2 heavy melting steel. The General Purchasing Officer of the Panama Canal at Washington has full information.

According to the U. S. Geological Survey, a report has been received from Missoula, Mont., that a little strip of ground about 1¼ miles long by ½ mile wide mined over 45 per cent of the gross tonnage of manganese produced during the war. The little town of Phillipsburg, which is a part of the strip, is the centre of trade.

At the seventy-first meeting of the executive committee of the National Metal Trades Association, held in New York on June 24, 33 applications were favorably acted upon, making the total membership of the association over 800.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

July	Copper, New York: Lake	Copper, New York: Electrolytic	Tin, New York	Lead: New York	Lead: St. Louis	Spelter: New York	Spelter: St. Louis
2	19.50	19.25	70.50	5.40	5.15	7.45	7.10
3	19.75	19.50	70.50	5.40	5.15	7.45	7.10
4	....	....	....	...	...	...	...
5	....	....	....	...	...	...	...
7	19.87½	19.62½	70.50	5.40	5.15	7.50	7.15
8	20.00	19.75	70.50	5.40	5.15	7.50	7.15

NEW YORK, July 8.

Business in all the markets has been slow on account of the Fourth of July holidays, but prices are very firm. Demand for copper is strong and prices continue to advance. The tin market continues quiet. The lead market is firm with demand rather light. Demand for zinc (spelter) is again strong and prices are rising gradually. Antimony is unchanged.

New York

Copper.—Yesterday and today demand for copper is reported to have increased measurably and prices have advanced. Electrolytic copper for July delivery cannot be bought for less than 19.75c., New York, which we quote as the market. It is even stated by some sellers that no better than 20c. can be done. For August delivery at least 20c. to 20.25c. is asked and obtained, and for July-August delivery the general quotation is not under 20c., all New York. Lake copper is also strong, with July delivery quoted at not less than 20c., New York, and August at least 20.25c. Consumers, evidently convinced that an advancing market is at hand, are commencing to provide for their needs, and it seems evident that 20c. copper is closer at hand than was thought possible a month ago. There is considerable export demand, but the bulk of the business so far done has been for domestic consumption. It is estimated that Japan's total purchases have amounted to 16,000 tons to date, and the recent buying for Japan has been largely responsible for the advance in price. No small part of the strength of the market has been due to the rapid rate at which Government accumulations have been disposed of. The entire surplus is now reported to have been sold.

Tin.—Announcement has been made that effective July 1 import licenses on pig tin and metal alloys containing tin will no longer be required after Sept. 1, when imported from countries other than the countries of origin. The removal of this restriction virtually makes the tin market completely open on and after Sept. 1, except that import licenses will be necessary for a time. Business, owing to the holidays, has been quiet. There has been very little demand. Import licenses on Straits tin from countries other than those of origin have already been issued valid on and after Sept. 1. The advance in the London market Monday has had its effect here so that quotations on Straits tin from England are 53c. per lb., and for Straits tin from the Far East 52c. For the American product, 99 per cent pure, 67c. to 68c. is asked. English Lamb and Flagg tin for importation is quoted at 52c.

Lead.—The market is quiet but very firm. Despite reports of a big demand for the metal most sellers regard the market as firm and state that a fair inquiry obtains, but thus far this has resulted in little business. The market is quoted unchanged at 5.40c., New York, or 5.15c., St. Louis, both for the leading interest and independents.

Zinc (Spelter).—Evidently in sympathy with copper, demand for zinc has increased both from domestic sources and export and the tendency is upward. Prime Western for July delivery is quoted at 7.15c., St. Louis, or 7.50c., New York, with August held at 7.20c., St. Louis, or 7.55c., New York. Japan is still reported to be an important buyer. Confidence on the part of most producers is strong.

Antimony.—The market is quiet and prices are unchanged at 8.37½c. to 8.50c., New York, duty paid.

Aluminum.—Quotations are unchanged at 33c., New York, for wholesale lots for early delivery for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market is firm and advancing. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	18.50
Copper, heavy and wire	17.25
Copper, light and bottoms	15.25
Brass, heavy	12.75
Brass, light	9.25
Heavy machine composition	17.75
No. 1 yellow rod brass turnings	10.00
No. 1 red brass or composition turnings	14.50
Lead, heavy	5.00
Lead, tea	4.25
Zinc	5.00

St. Louis

ST. LOUIS, July 7.—The non-ferrous markets have been quiet but firm with lead closing at 5.15c and spelter at 7c in car lots. In less than car lots: Lead, 5.40c to 5.50c; spelter, 7.50c; tin nominal; copper, 18.50c; antimony, 9.50c. In the Joplin district ore was firm at an advance, the top grades of zinc blende going at $43 to $44 per ton, basis 60 per cent. Calamin was $25 to $28, basis 40 per cent, and lead $60 per ton, basis 80 per cent. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7c; heavy yellow brass, 9.50c; heavy red brass, 13.50c; heavy copper and copper wire, 13.50c; light copper, 11.50c; pewter, 35c; tinfoil, 44c; lead, 4c; tea lead, 3c; zinc, 3.50c; aluminum, 18c.

Chicago

CHICAGO, July 8—The holidays of the past week put a damper on buying. Despite a slackening in business copper advanced one-half a cent. There has been no change in the prices of other metals. The tin situation is unsettled, although some purchases for future delivery are being made at from $51 to $55, most buyers seem to be willing to take their chances on covering their requirements as they develop. Old metal prices remain unchanged. We quote copper at 19.50c. to 20c. for carloads; tin, 70c. to 72.50c.; lead, 5.25c. to 5.35c.; spelter, 7.10c. to 7.25c.; antimony, 9.50c. to 10c. On old metals we quote copper wire, crucible shapes, 15.25c.; copper clips, 14.75c.; copper bottoms, 13.50c.; red brass, 15.25c.; yellow brass, 10c.; lead pipe, 4c.; zinc, 4c.; pewter, No. 1, 35c.; tinfoil, 37c., and block tin 50c., all these being buying prices for less than carload lots.

Record Manganese Ore Output in 1918

The domestic production of manganese ore in 1918, according to statistics compiled by D. F. Hewett, of the U. S. Geological Survey, Department of the Interior, was greater than in any preceding year. The shipments of high-grade ore during the last quarter of the year were 75,465 tons, against 90,738 tons, 82,481 tons, and 55,682 tons for the third, second, and first quarters, respectively, and the total for the year was therefore 304,366 tons, or two and a half times that for 1917, which was the highest previously recorded. The shipments of low-grade material were also the highest on record—898,332 tons containing 10 to 35 per cent of manganese and 242,585 tons containing 5 to 10 per cent of manganese.

The New England Foundrymen's Association will hold its next meeting at Providence, R. I., Aug. 13, decision having been reached to hold no session in July.

The quantities of manganese ore exported from Brazil were 393,388 metric tons in 1918; 532,855 in 1917; and 503,130 in 1916.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

The prices below are based on those announced at Washington by the Industrial Board on March 20, 1919, effective the following day, which since that date have largely governed market transactions, though there have been variations, as indicated in market reports on other pages.

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 14c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and Zees, structural sizes, 2.45c.

Wire Products

Wire nails, $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00; galvanized wire, $3.70; galvanized barbed wire and fence staples $4.10; painted barbed wire, $3.40; polished fence staples, $3.40; cement-coated nails, $2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.70 base
Large boiler rivets $3.80
¼ in., 5/16 in. and 7/16 in. diam..65-10 and 5 per cent off list
Machine bolts, h.p. nuts, ⅜ in. x 4 in.:
  Smaller and shorter, rolled threads..60-10-5 per cent off list
  Cut threads .....60-5 per cent off list
  Larger and longer sizes .....50-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
  Smaller and shorter .....45-10-10 per cent off list
  Larger and longer .....40-10-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
  Smaller and shorter, rolled threads.....60-5 per cent off list
  Cut threads .....50-10-5 per cent off list
  Larger and longer sizes .....45-10 per cent off list
Lag bolts .....65-5 per cent off list
Plow bolts, Nos. 1, 2, 3.....60 per cent off list
Hot pressed nuts, sq. blank.....3.25c. per lb. off list
Hot pressed nuts, hex. blank.....3.25c. per lb. off list
Hot pressed nuts, sq. tapped.....3c. per lb. off list
Hot pressed nuts, hex. tapped.....3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....3c. per lb. off list
Semi-finished hex. nuts:
  ⅝ in. and larger .....70-10 per cent off list
  9/16 in. and smaller.....80 per cent off list
Stove bolts, in packages .....75-10-10-5 per cent off list
Stove bolts, in bulk .....2½ per cent extra
Tire bolts .....60-10-10-5 per cent off list

The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52; chain rods, $60; screw, rivet and bolt rods and other rods of that character, $60. Prices on high carbon rods are irregular. They range from $65 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., $3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 per 100 lb. in carload lots of 200 kegs or more, and $4.90 in small lots. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I-C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜....	50½	24	⅛ and ¼.....	29½	2½
½	54½	40	⅜	30½	3½
¾ to 3.....57½		44	½	34½	16½
			¾ to 1½.....	39	23½

Lap Weld

2	50½	38	1¼	24½	9½
2½ to 6.....	53½	41	1½	31½	17½
7 to 12.....	50½	37	2	32½	18½
13 and 14.....	41	..	2½ to 6.....	34½	21½
15	38½	..	7 to 12.....31½		18½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜...	46½	29	⅛, ¼ and ⅜....	28½	11½
½	51½	39	½	33½	20½
¾ to 1½.....	55½	43	¾ to 1½.....	39½	24½
2 to 3.....	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	25½	10½
2½ to 4.....	51½	40	1½	31½	17½
4½ to 6.....	50½	39	2	33½	20½
7 to 8.....	46½	33	2½ to 4.....	35½	23½
9 to 12.....	41½	28	4½ to 6.....	34½	22½
			7 to 8.....	26½	14½
			9 to 12	21½	9½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.....	40½	3½ to 4½ in.....	—16
2½ to 3¼ in.....	30½	3 to 3¼ in.....	— 1½
2¼ in.	24	2½ to 2¾ in.....	+ 1
1¾ to 2 in.....	19½	2 to 2¼ in.....	+10
		1¾ to 1⅞ in.....	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in. $327		1¾ in. $207	
1¼ in.	267	2 to 2½ in.	177
1⅝ in.	257	2¾ to 3¾ in.....	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

	Cents per lb.
Blue Annealed—Bessemer	
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12.....	3.60
Nos. 13 and 14.....	3.65
Nos. 15 and 16.....	3.75
Box Annealed, Ore Pass Cold Rolled—Bessemer	
Nos. 17 to 21.....	4.15
Nos. 22 to 24.....	4.20
Nos. 25 and 26.....	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55
Galvanized, Black Sheet Gage—Bessemer	
Nos. 10 and 11.....	4.70
Nos. 12 and 14.....	4.80
Nos. 15 and 16.....	4.95
Nos. 17 to 21.....	5.10
Nos. 22 to 24.....	5.25
Nos. 25 and 26.....	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16.....	4.15
Nos. 17 to 21.....	4.20
Nos. 22 to 24.....	4.25
Nos. 25 to 27.....	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31.....	4.45

MILL ADDITIONS

Plans of Clinton-Wright Wire Co. Provides for Large Increase of Capacity

The Clinton-Wright Wire Co., Worcester, Mass., the merger of the Wright Wire Co., Morgan Spring Co. and Clinton Wire Cloth Co., announces that it will add in a large way to the wire mills at Palmer, Mass., the purpose being to add capacity of about 10,000 tons per annum, to care for the needs of the Clinton Wire Cloth Co.'s plant, which hitherto has bought its wire in the market. The new wire drawing machinery will be built for the most part in the shops of the Wright company at Worcester, and the company will not be in the market for any great amount of equipment in connection with the Palmer extensions. However, it is probable that an additional mill will be erected, though there is at present some available space in existing buildings.

Officials of the new corporation state that the purpose is eventually to establish steel mills, but not in the New England territory. They state that Buffalo is favored as the site, in order that advantage may be taken of lake transportation water facilities. However, no plans have been made for the immediate carrying out of this project.

The first steps are being taken in consolidating the sales forces and the general distributing system of the three companies. The Wright Wire Co. maintains salesrooms in various of the great distributing centers of the country, and the Clinton and Morgan companies have systems of similar agencies, though on a less ambitious scale. The consolidation of these offices will proceed gradually. Already conferences of the combined sales forces have been held with the idea of studying plans for future sales methods.

The Clinton-Wright Wire Co. also makes announcement that it is preparing tentative plans for the distribution of the common stock among the employees, following in a general way the practice which the United States Steel Corporation has carried on for a number of years. The common stock has been issued in the market at $36 on par value of $50, and has since sold on the curb at $37 and better. Details of the plan as affecting employees have not been worked out, but the distribution will be on an instalment basis, in amounts dependent upon the workers' earning powers, and at a price each year fixed by the average market value for the period.

Active Sheet Demand in the Youngstown District

YOUNGSTOWN, OHIO, July 8—Evidences of a revival in the building trades are shown by the improved demand for corrugated roofing and roofing products, and galvanized sheets. Makers of formed products state inquiries are being received in volume. Black and blue annealed sheet business is also getting back to normal, while the one maker in the district equipped to roll highly finished sheets recently increased his operating mills from four to six. Sheet mill schedules are swinging back into their old form, with plenty of business booked and in sight. While some orders rolled during the past few weeks were placed at slight concessions to keep schedules as regular as possible, this practice has been discontinued with the appearance of business in larger volume. Stock lists of accumulated output are being sent out by one or two makers.

Demand for other finished products continues strong. A leading pipe producer has refused some lap-weld business, because of heavy bookings ahead requiring the full capacity of the tubular departments. Standard-sized pipe is in better demand while butt-weld business is coming in larger volume.

Merchant blast furnace operators report a livelier tone in the pig iron market, with consumers placing more business. Some foundry iron orders have been booked for delivery in September.

The semi-finished steel market is keeping pace with that for finished products, and sheetmakers are taking both Bessemer and open-hearth sheet bars. Increased automobile production is reflected in the demand from the automotive industry for steel sheets and parts.

Operating schedules of furnaces and finishing departments continue with little change.

Navy Accepts Bids on Steel—Large Tonnage of Armor Plates Pending

WASHINGTON, July 8—After considering the matter for several weeks, the Navy Department finally has accepted the prices bid on 20,000 tons of plates, shapes and bars for four battle cruisers and one fuel ship. The prices were uniform and based on the schedule as approved by the Industrial Board. The action of the Navy Department justifies the scale as approved by the Industrial Board, as the Navy Department made a thorough investigation of costs before taking action.

The prices approved apply to 14,000 tons requisitioned from the Carnegie Steel Co., and also for the additional steel for which bids were received, the contracts being awarded to the same company. Under the original requisition order, made on May 16, the Navy Department paid 90 per cent of the bid price, the balance being subject to adjustment.

The Navy Department has received private bids on approximately 50,000 tons of armor plate for six battleships. This is the largest amount ever asked for by the Department. Secretary Daniels has been engaged in a controversy with the armor plate manufacturers ever since he took office, and there is considerable interest in these contracts.

Bids have been received by the Navy Department on 3600 tons of steel plates and 1000 tons of shapes and bars to be used in the construction of a repair shop at the Puget Sound Navy Yard. The bids were all on the basis of the Industrial Board's price scale. None has been awarded as yet.

Contracts for Sheet Mill Furnaces

For the Eastern Rolling Mill Co., Baltimore, the George J. Hagan Co., Pittsburgh, will furnish all materials and labor for the erection of 12 Hagan-Allis continuous pair heating furnaces, 12 double type stoker-fired sheet furnaces, and six stoker-fired double length battery annealing furnaces, work on which will commence in the latter part of August. The Hagan company has also received a contract from the American Sheet & Tin Plate Co. for 24 sheet and pair furnaces, which are now being erected in its plant at Gary, Ind. All the above furnaces are stoker-fired, using slack bituminous coal. They are of heavy construction, with elaborate water shields and smoke hoods. The company is erecting for the American Sheet & Tin Plate Co. at Gary, Ind., six double-length, stoker-fired annealing furnaces. A contract from the LaBelle Iron Works, Steubenville, Ohio, calls for four Hagan-Allis continuous pair furnaces, four Hagan-Bailey combination furnaces and eight double compartment sheet furnaces, all to be stoker-fired. One from the Canton Sheet Steel Co., Canton, Ohio, is for a Hagan-Costello open annealing furnace.

At the Otis Steel Co.'s plant, Cleveland, the erection of one of the largest continuous pair or bar heating furnaces of the Hagan-Allis patented type will begin within the next ten days. This furnace is to heat bars and slabs for a new jobbing mill. A contract from the Whitaker-Glessner Co., Wheeling, W. Va., on which work is now progressing is for seven Hagan-Allis patented continuous pair furnaces, for the Portsmouth, Ohio, plant. Other orders received are from the Newport Rolling Mill Co., Newport, Ky., for four Hagan-Allis continuous pair furnaces, four Hagan-Bailey combination furnaces, two Hagan-Costello open annealing furnaces, eight standard double compartment sheet furnaces, and three standard double compartment double length annealing furnaces.

A French company has recently purchased from the Hagan company the foreign rights on its devices for sheet and tin mill furnaces and jobbing mill furnaces and has already closed several European contracts for its furnaces. It will handle all Hagan work in Europe.

FOREIGN CONDITIONS

Improvement in Iron Industry in Luxemburg—Proposed Sale of German Property

A New York engineer, a native of Belgium, has just returned from a short visit to his native country and France, and reports conditions in those countries and in Luxemburg are rapidly improving. He finds, however, that costs are very high and may advance still further. The working men, he states, were under suspicion at the beginning of the war—that is, a great many of the people did not believe the laboring classes would fight, but they did go to war and fought splendidly, and now feel that they are entitled to the greatest consideration in wages and other matters. "There is also a pathological condition which is to be considered," he said. "The people of all the warring countries in Europe are tired out—are so weary that they do not feel like working. Hence efficiency is greatly reduced. But the countries that have made such magnificent records in time of war will do so in peace, and I believe that while the recovery will be slow, it will be sure. The outlook is that Belgium will recover even more rapidly than France.

"Conditions in the Luxemburg iron and steel industry are improving very much. The ore trade and export movement to Belgium and France is practically normal again. The only restriction is a shipping permit from the Inter-Ally Commission of Luxemburg. Prices are advancing continuously, and 8 to 10 francs per ton are paid for ore at the railroad pier of the mine heads.

"Pig-iron production depends entirely upon the arrival of coke from Westphalia, and the railroad condition controls entirely that factor. During June, most of the work was in putting furnaces back into blast. Production is not over 30 per cent of capacity.

"The financial transaction concerning the sale of the plant controlled by the German interest of Gelsenkirchen and Deutsch-Luxemburg (Differdingen) are progressing, but no definite results have been obtained. Political conditions delay the negotiations, as the various governments interested want the financial control problems solved in a way that will satisfy their respective national interests. The transfers involved are not limited to the blast furnaces and steel works alone, but include the immense mineral concessions and ore reserves.

"According to German sources, the Soc. de la Marine et d'Homecourt is interested in the Differdingen works, while the Gelsenkirchen properties in Audun, Esch and Rothe Erde are to be taken over by a consolidation headed by the Creusot Co. in which French capital is interested 60 per cent, Belgian capital 20 per cent, and Luxemburg capital 20 per cent.

"The general meetings of directors held in Berlin on May 20 and June 3 at the headquarters of the Gelsenkirchen Berg works declared 6 per cent dividends for 1918 against 12 per cent for 1917. The chairman of the board of directors, David Salomonsohn (director of the Disionto Gesellschaft) disclosed the situation of the company and explained the sale of all the properties situated on the left bank of the Rhine, and was authorized to negotiate to that end. General Manager Emil Kirdorf made a very pessimistic statement on the future outlook of the company and losses incurred by it owing to the defeat of Germany and the armistice conditions. To May 1, 24,500,000 marks have been lost. Only a speedy settlement of the pending negotiations with the French interests will avoid the crisis which is imminent."

Bar Iron Scale Settled

Late last week at Atlantic City, N. J., a settlement was reached between the Amalgamated Association of Iron, Steel and Tin Workers of Pittsburgh, and bar iron mills in the Central West that sign the Amalgamated scale on the puddling and finishing scales, for the year commencing July 1. The scales have been signed by representatives of both sides, and there will be no interruption of work in bar iron mills that are governed by the organization. The new scale is based on a 2.50c. card for bar iron, on which the puddling rate is $12.37½ per gross ton, while the old scale was based on 2.75c., and the puddling rate was $12.05 per gross ton. In other words, the men have received a general advance of about 5 per cent. For each advance of 0.05 cents in the bar iron card above 2.50c. per lb., boiling advances 25c. per ton, and finishing mill wages on the same basis. Should the card rate on bar iron go to 1.30c. or below, then puddling advances only 20c. per ton, until it reaches 1.80c., when the advance is 25c. per ton. No change was made in working conditions, except in single turn puddling mills, the working day remains at 9¼ hours, while in double turn puddling mills the work day is reduced to 8 hours. The Amalgamated Association had made some extreme demands in the new scale presented to the manufacturers in conference at Atlantic City last week, but these were all withdrawn, with the exception that puddlers and finishers will receive a general advance of about 5 per cent for the scale year, effective from July 1, last.

As explained elsewhere in this issue, the July-August rate for puddlers has been reduced as the result of the last bi-monthly settlement.

Want More Ships for New Orleans

H. H. Garver, foreign trade commissioner of the Mississippi Valley Association, recently went to New York and Washington to discuss with the United States Shipping Board the desirability of allocating to the port of New Orleans more vessels for the trade which the activities of the association is expected to direct through that gateway. At the same time, he consulted with the Mexican financial interests the transfer of credit to Chicago to finance business developed through the operations of the trade bureau which the Chicago Association of Commerce has opened in Mexico City.

Congressman Criticizes Method of Buying Steel

WASHINGTON, July 8.—Reference to a letter from E. H. Gary calling the attention of the Council of National Defense to proposed violations of law in purchases in the early days of the war was made in abstracts from the minutes of the Advisory Commission of the Council read into the record of the House committee which is investigating war expenditures.

Commenting on the matter, Representative W. J. Graham of Illinois, chairman of the investigating committee, said:

"The minutes show that the members of this Advisory Commission were advised that they were violating the law in permitting committees of the Council of National Defense to direct purchases from their own companies, as will be apparent from a letter read by Mr. Baruch on June 1, 1917 to the commissioners which he had received from Mr. E. H. Gary, chairman of the committee on steel and steel production of the Advisory Commission.

"This letter was referred to the Attorney General on June 2 and on June 6 the Attorney General answered it, saying that matters referred to in Mr. Gary's letter as violations of the law were matters of 'national' policy rather than a legal question.

"Afterwards, when there was evidently a discussion in Congress as to the illegality of members of the committees buying from themselves, the Council discussed this general policy, and it was suggested that 'This embarrassment might be removed by the plan of the committee reorganization now under consideration.'

"Later the minutes show that on account of this so-called embarrassment, the War Industries Board was created, and committees appointed by the National Chamber of Commerce so that the letter of the law might be complied with, but by which scheme no part of the method of buying was changed in the slightest degree, so far as I can observe."

PERSONAL

The Keller Pneumatic Tool Co., Chicago and Grand Haven, Mich., announces the appointment of F. S. Eggleston, Jr., as manager of its New England branch with offices at 259 Franklin street, Boston. For the past 14 years Mr. Eggleston has represented the Chicago Pneumatic Tool Co. in New England, the last four years as manager of the Boston branch office of that company. In addition to the Keller line of pneumatic tools and accessories, Mr. Eggleston will also represent the Cincinnati Electrical Tool Co., the Gardener Governor Co., the Electro-Magnetic Tool Co. and the Detroit Hoist & Machine Co.

Alton B. Parker has been elected president of the National Civic Federation in place of V. Everit Macy, resigned because of poor health. Judge Parker was previously chairman of the Federation's department on reform in legal procedure. Mr. Macy will serve as vice-president and a member of the Executive Council. Besides its reconstruction and labor problems the federation will continue its campaign against Bolshevism, which includes an investigation of the textbooks on history, political economy, civics and economics used in colleges and other schools.

R. S. Hammond has succeeded F. J. Page as Pittsburgh representative of Whiting Foundry Equipment Co., Harvey, Ill. Mr. Hammond will have his office at 1224 Fulton Building.

H. E. Henry, formerly sales manager of the Fulflo Pump Co., Blanchester, Ohio, has accepted a position as sales manager of the Michigan Machine Co., Detroit, maker of pumps for use in connection with machines and tools for lubrication.

Corp. William A. Nugent, who served in Company L., 21st Engineers, has returned from France, and resumed his duties with the Independent Pneumatic Tool Co., Chicago, as traveling representative in Indiana.

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, announces the appointment of D. B. Coey as representative for the Chicago district, with offices at 1134 National Life Building, 29 South LaSalle Street, Chicago.

H. B. May, for two years efficiency engineer of the Youngstown Sheet & Tube Co., Youngstown, O., with exception of six months spent in the United States air service, has joined the staff of C. E. Knoeppel & Co., industrial engineers in New York.

J. H. Schoenly, formerly manager of sales of Josef F. A. Comstedt, steel, iron, metals, New York, has joined the Bethlehem Construction Co., Bethlehem Trust Building, Bethlehem, Pa.

Robert S. Maddocks, formerly assistant secretary the Smiley Steel Co., New York, has joined the sales force of the Cambria Steel Co. at the New York office, 165 Broadway.

Erie Crucible Steel Co., high speed and carbon tool steel, Erie, Pa., has appointed Michigan and New England representatives as follows: George W. Way, 858 Penobscot Building, Detroit, for the past five years connected with the Detroit office of the Carnegie Steel Co., where he has made a specialty of the automobile trade and formerly superintendent of the forge and machine shop of the Union Switch and Signal Co., with which he had been for 14 years; in New England M. A. Palmer Co., 469 Atlantic Avenue, Boston, headed by Mr. Palmer, for 25 years in the steel business in the New England States, having, until he resigned three years ago to form the above company, represented Hawkridge Bros., in the district.

D. W. Beckwith has been appointed secretary and general manager of the Positive Lock Washer Co., Newark, N. J., in the place of F. S. Sayre, who died June 15. In 1905 Mr. Beckwith joined the sales department of the Manhattan Electric Supply Co.; the next year he became attached to the office of the division passenger agent of the Lackawanna Railroad. In February, 1907, he joined the Positive Lock Washer Co. as stenographer, studying the business in the office and in the factory. In 1913 he traveled for the same company through New England, New York and Pennsylvania. In 1918 he was made assistant manager.

Francis S. Carr, vice-president Pennsylvania Steel Export Co., Widener Building, Philadelphia, has returned from a four months' stay in Europe. He booked orders in England for about 8000 tons of steel, but says he found it difficult to close anything in France. He opened an office for his company at Amsterdam, Holland.

Thomas E. Farrell, who has been in exclusive charge of the metals department of the Ohio Corrugating Co., Warren, Ohio, has resigned to become president and treasurer of the Sheet Metal Mfg. Co., Youngstown, Ohio, a recently organized corporation which will manufacture and wholesale sheet metals of all description. The company will erect a large warehouse at Youngstown.

J. P. Davis, purchasing agent Belden Mfg. Co., Chicago, has been elected second vice-president of the Purchasing Agents' Association of that city.

H. A. Brassert was elected chairman of the board at a recent meeting of the directors of Freyn, Brassert & Co., Chicago.

Gov. John Franklin Fort was unanimously chosen chairman of the Federal Trade Commission and Victor Murdock of Kansas, vice-chairman on July 1. As vice-chairman Mr. Murdock will sit as acting-chairman during any absence of the chairman. John Franklin Fort was at one time judge of the Supreme Court of the State of New Jersey and previously had long practised law in the East. He preceded President Wilson as Governor of New Jersey.

Warren F. Perry has been given the title of assistant to the president of the Brier Hill Steel Co., Youngstown, Ohio, in charge of industrial relations. Mr. Perry has been in charge of this work for some time. He was for many years secretary to the general superintendent of the Carnegie Steel Co., Youngstown district, and was later superintendent of transportation for the same company, in this district.

Arthur B. Sonneborn has been placed in charge of the Detroit office of the Federal Machine & Welder Co., Warren, Ohio, located at 1916 Ford Building Fred C. Wilder will take care of the Ohio territory of the company, with an office at 401-403 Garfield Bank Building, Euclid Avenue, Cleveland. Both were recently released from service, the former having been instructor in the radio division, Dallas, Tex., and the latter having returned from 23 months' service with the Thirty-second Division in France. Mr. Wilder was formerly chief engineer with the Fisher Body Corporation, which has 23 plants in Detroit.

Leonard W. Williams, of the pig iron firm of Park & Williams, Inc., Real Estate Trust Building, Philadelphia, has returned from a stay of several months in Europe, during which time he studied the pig iron situation abroad on behalf of F. R. Phillips & Son Co., exporter of iron and steel, Pennsylvania Building, Philadelphia. Waldo Phillips, of the latter company, who accompanied Mr. Williams abroad, will remain in England indefinitely.

J. S. Tritle, St. Louis manager for the Westinghouse Electric & Mfg. Co., was elected president of the St. Louis Electrical Board of Trade at the recent annual meeting of the board. H. M. Goodell, district manager for the Wagner Electric Mfg. Co., St. Louis, was elected vice-president of the board.

Marcel Knecht, director Bureau of French Information, who recently delivered an address before the American Iron and Steel Institute in New York, was signally honored by the University of Wisconsin when the degree of doctor of laws was conferred upon him at the annual commencement exercises. The degree was bestowed in recognition of Monsieur Knecht's emi-

nent position in French educational circles and his indefatigable efforts to strengthen the ties of friendship between his country and the United States. His work has been particularly efficacious in bringing about a thorough understanding between the iron and steel industries of the two countries.

H. B. Clough, Japanese representative of the Pennsylvania Steel Export Co., Widener Bldg., Philadelphia, stopped in Philadelphia this week on his way to England to attend his mother's golden wedding anniversary.

John A. McGregor, formerly president of the Union Iron Works Co., San Francisco, has tendered his resignation as Pacific Coast representative of the Bethlehem Shipbuilding Corporation, Ltd., but will continue his connection with the United States Shipping Board.

Clarence E. Kinney, formerly with the Symington properties, has become associated with Ogden R. Adams, at Rochester, N. Y., in the capacity of general manager and sales engineer.

George P. Thomas, president Thomas Spacing Machine Co., Pittsburgh, will sail for Europe on Tuesday, July 15, on an extended business trip for his company.

OBITUARY

PROF. OSKAR SIMMERSBACH, who died in Berlin, Germany, Dec. 14, 1918, in his 47th year, had spent some time in the United States in connection with blast furnace and coke oven operations. He was a son of Franz Simmersbach, director of the German coke syndicate. He entered the Technische Hochschule at Aachen in 1891, and later went to the Mining Academy at Berlin, studying iron and steel metallurgy, with still further work done later at the University of Leipzig. He followed blast-furnace work particularly at the Mathilden Hütte in Harzburg, and the Donnersmarck Hütte in Upper Silesia. During the years following 1895, when only 26 years old, he went to a plant in South Russia as blast-furnace superintendent. In 1906 he founded and operated a company for the design and construction of steel plants in Düsseldorf. He became professor in metallurgy in 1908 in the Technische Hochschule at Aachen, and in July, 1909, he went as professor to a similar and newly established institution at Breslau. The scientific work carried out by Mr. Simmersbach covered almost the whole range of iron and steel metallurgy, especially blast-furnace and coke-oven practice. During the latter years of his life many articles appeared on these subjects in *Stahl und Eisen*. His book, "Foundation of Coke Chemistry," was published in 1895 and was quickly translated into French and English. In all his works the practical side was especially dwelt upon because of his own long practical experience.

GEORGE A. FARRALL, vice-president and general manager Massey-Harris Harvester Co., Inc., successor to the Johnston Harvester Co., Batavia, N. Y., died following an automobile accident June 20. He was born in Hamlin, Monroe County, N. Y., Nov. 4, 1856, studied at Rochester University, and later taught school. He joined the Johnston Harvester Co. in 1884, first with the experimental department, later becoming foreman of the wood shop, next foreman of the binder-erecting department, then general superintendent of the plant. In 1895 he became member of the board of directors. He was elected vice-president in 1899 and was president from 1910 to 1911, at which time the company was taken over by the Massey-Harris Co., Ltd., of Toronto. Mr. Farrall took out a large number of patents. He belonged to the Batavia Manufacturers' Association, the Chamber of Commerce and was interested in affairs of church, municipality and charity.

FRED S. SAYRE, secretary and general manager the Positive Lock Washer Co., Newark, N. J., died suddenly June 15. He was born Feb. 27, 1864, in Yates County, New York, and had lived in Newark for the last 28 years. He was with the Vreeland Gas Engine Co. for two years, was bookkeeper with the Positive Lock Washer Co. for two years, and traveled for Bless & Drake, smoothing iron manufacturers, Newark, for a year. Later he rejoined the Positive Lock Washer Co. as office manager, was then made assistant general manager and in 1915 assumed the position in which he died.

WILLIAM H. COLCORD, for 16 years outside sales manager for the Clinton Iron & Steel Co., Pittsburgh, in the sale of foundry and basic iron, died recently at the home of his brother in Chicago. Mr. Colcord, who was 71 years of age, was a native of St. Louis, and before joining the Clinton Iron & Steel Co. had been connected with a western harvester company, and also had been in business with his father. His body was taken to St. Louis for burial.

WILLIAM HOLMES BLACK, aged 57, secretary Standard Scale & Supply Co., Pittsburgh, died at his home in that city Monday, June 30. He was born Sept. 29, 1862, in Pittsburgh. He was graduated from Harvard University in 1887. Mr. Black was with the Standard Scale & Supply Co. for over 20 years and took a prominent part in the building up of the large selling organization of that company.

OSCAR OTTO, superintendent South Philadelphia Machine Works, Westinghouse Electric & Mfg. Co., died June 30 from injuries sustained in an automobile accident. He was 60 years of age and formerly held important shop executive positions with the Chicago & Northwestern and Northern Pacific railroads.

WILLIAM THUM, superintendent of the East Chicago, Ind., refinery of the United States Metals Refining Co., died there of pneumonia on June 28 following a brief illness.

ELWYN A. MALLORY, SR., superintendent Milwaukee Corrugating Co., Milwaukee, died Friday, July 4, at the age of 66 years.

NORMAN H. FAY, president Fay & Scott, engine lathes, mill and factory supplies, Dexter, Me., died June 13.

Government Material for Sale

The following sales of iron and steel material will be made by the Government through the Ordnance Department by means of sealed proposals:

New York office: 52 tons standard carbon crucible tool steel at Heller Bros., 879 Prospect Ave., Newark, N. J., bids to be in by 11 a. m. July 14; 1842 tons of steel shells with 33 tons of copper bands attached at the General Ordnance Depot, Morgan, N. J., bids to be in by 11 a. m. July 15; 371 tons cold rolled steel at the John Thomson Press Co., Long Island City, N. Y., bids to be in by 11 a. m. July 21.

Rochester office: 88 tons of 4.7-in. common steel forgings A.A., 77 tons of 9.2-in. adapter forgings, common steel, 435 tons 5-in. shell forgings, common steel, all at the Atlas Steel Casting Co., Buffalo, bids to be in by 12 noon, July 15; 654 tons of 9.2-in. steel base plug forgings, common steel, and 5500 tons 9.2-in. steel forgings, common steel, at the Wickwire Steel Co., Buffalo, bids to be in by 12 noon, July 17; 10 tons cold rolled strip steel and 60 tons bar stock at the United States Eddystone Rifle Storage Arsenal, Eddystone, Pa., bids to be in by 3 p. m. July 11; 750 tons of 3 per cent nickel steel turnings at the Tacony Ordnance Corporation, Tacony, Pa., bids to be in by 11 a. m. July 11.

St. Louis office: 4385 gross tons of billets, 5½ in. square, at the Curtis & Co. Mfg. Co., St. Louis, bids to be in by 11 a. m. July 15.

The first Belgian blast furnace to be started since the armistice has recently been relighted at the Usines de la Providence, Marchienne-au-Pont. Four of the blast furnaces belonging to this important company were destroyed by the Germans, and the fifth furnace in which the fires have just been relighted was denuded of all its fittings, which were either destroyed on the spot or removed to Germany.

President Thomas J. Bray of the Republic Iron & Steel Co. announces that certain water rights have been purchased in the Baldwin dam, in the Mahoning river, near Youngstown, Ohio, which will permit the company to maintain a dam farther down the river.

Investigation of Bearing Metals

The sub-committee on bearing metals of the Research Committee of the American Society of Mechanical Engineers reported the results of its investigations at the June meeting of the society at Detroit. In the opinion of the committee the only mechanical or physical test of a bearing alloy, in the aggregate, that can serve any useful purpose, is that of determining whether the given alloy has a sufficiently high factor of safety against possible distortion or rupture under specified service conditions at service temperature. All other characteristics are of a microscopic nature, depending entirely upon the properties of the individual crystals of the alloy, upon their orientation, relative hardness, fusing temperature, quantitative proportions and the like.

"Our studies have convinced us," the report says, "that any work on our subject without the application of modern metallography is an absolute waste of time; we also feel that studying the hardness of the individual microscopic crystals is of the greatest importance in supplementing the application of metallography to our subject."

The instrument shown in the committee's last report has been perfected to a much higher degree. This instrument determines the characteristic of a crystal which is the combination of three of the five fundamental conceptions of hardness: namely, the combined effect of cutting hardness, scratch hardness and penetration hardness. This is done by very slowly moving an exceedingly hard and sharp point under a definite pressure, over a highly polished surface of the crystal to be tested. The width of the cut, scratch or penetration is a function of its depth and, therefore, measuring the width of the mark gives the means for determining the combined characteristic representing the hardness of any crystal.

In order to make all results directly comparable the committee is working to establish conventional units; that is, a scale of microhardness, thus to make it possible to consider the various crystals in the many different alloys in terms of exact degrees of hardness.

Essential Characteristics of Alloys

The report points out that it is not only necessary that a bearing alloy shall be composed of chemically dissimilar crystals, but it is all-important that these crystals shall have a marked degree of difference in their physical hardness and wearing qualities. "The essential characteristic of all bearing alloys is a structure made up of alternately hard and relatively soft microscopic particles intimately mixed. The function of the hard particles is to support the load and resist the wear. These bearing crystals should not be hard enough to prove distinctly abrasive to the journal surface. General experience shows that an extreme hardness of the bearing crystals is characterized by an excessive wear of the journal. The function of the softer or more readily abraded crystals is that of being plastic and permitting the bearing crystals to adjust themselves to surface requirements of the journal. These softer crystals are also more readily abraded, and therefore wear slightly below the surface of the bearing crystals and thus form slight depressions upon the bearing surface which serve for the retention of the lubricant. However infinitesimal in amount this may seem, nevertheless it is this lubricant that prevents scoring or seizing when the journal is starting up from rest at a time when actual metallic contact between the bearing surfaces exists. The same is equally true under an excessive load. This function of retaining a slight quantity of the lubricant upon the bearing surfaces when metallic contact exists, characterizes a bearing alloy in its truest sense. Therefore a bearing metal may be defined as an alloy that is capable of retaining a lubricant on a bearing surface.

"In the operation of a bearing under normal conditions, when a continuous and unbroken film of lubricant exists it matters little what metals are used while the film is sustaining the entire load. In the starting and stopping of the journal, however, or at all such other times when the film is interrupted and metallic contact exists, it then becomes very important that the properties of a bearing metal should be present.

"A matter of importance, which seems not to have been considered heretofore, is the fusing temperature of the bearing crystals. From observations made it is evident that under severe conditions where relatively low-fusing bearing crystals exist in a high-fusing alloy these bearing crystals actually fuse on their surfaces during the process of the "running in" of the bearing. The delta copper-tin crystal may be cited as a particular example, and in some severe conditions corresponding to automotive worm-drive service the alpha copper-phosphorus crystal seems to function in a similar manner. It is doubtful whether these conditions ever obtain in any of the babbitts, since their bearing crystals are the highest-fusing compounds of these alloys.

"The study of bearing metals is very incomplete unless these alloys are considered in conjunction with the other corresponding bearing member. The extreme variety of modern steels makes this necessary, since a bearing alloy suited for a soft low-carbon machine-steel journal would not be an economic selection for a high-carbon nickel-chrome heat-treated journal, and a most economic selection for the latter would prove destructive to the former.

"It seems exceedingly improbable that laboratory accelerated service tests can ever give general satisfaction, owing to the difficulty of reproducing in a few hours' time the equivalent of many years of service conditions. It is our conviction that much more can be learned from the study of failures, and also in studying old bearings together with their journals, which have given eminently satisfactory service for an exceptionally long period."

Promising Outlook for Foundry Convention

The committee on papers of the American Foundrymen's Association, through C. E. Hoyt, secretary-treasurer, Harris Trust Building, Chicago, announces that 34 papers and addresses already have been secured for the annual convention of the association to be held at Philadelphia, Sept. 29 to Oct. 3. It is stated that the authors include some of the most prominent foundrymen in the United States and Europe. A number of the papers will be illustrated by motion pictures, showing operations in detail. Sufficient material is assured to provide special sessions on gray iron, malleable iron, and steel foundry problems. Attention will also be devoted to the educational problems of the foundry industry, and in a broad way to questions of management and personnel.

Among the papers for which arrangements have been made are the following:

"Ships Built of Steel Castings From a Technical Foundry Standpoint," by Myron F. Hill, president Cast Steel Ship Corporation, New York.

"Micro-Motion Study for Foundrymen," with motion pictures, by F. B. Gilbreth, Providence, R. I.

"Training Men for Foundry Work," by C. C. Schoen, Yale & Towne Mfg. Co., Training Section, U. S. Department of Labor.

"Investigation of Steel Castings on German Submarines," by Prof. William Campbell, Columbia University, New York.

"Education and Welfare in the Foundry Industries," by C. A. Prosser, Director, Federal Board for Vocational Education, Washington, D. C.

For the exhibition of foundry and metal-working machinery more space has been reserved than was used at any previous convention.

The United States Civil Service Commission announces an open competitive examination for metallurgist, for men only, to fill a vacancy in the Navy Yard, Norfolk, Va., at $2800 a year. Applicants should apply for form 1312 stating the title of the examination desired, to the Civil Service Commission at Washington, or to the secretary of the United States Civil Service Board at the nearest Custom House.

Machinery Markets and News of the Works

DELIVERIES LONGER

Increasing Demand for Tools is Reflected

Some Prices Advanced—Business Continues in Fair Volume in Central West

An indication of improving conditions in the machine-tool industry is the deferred deliveries now quoted by some builders. In some cases inability to make prompt shipments has lost orders for certain companies. A milling machine manufacturer in the Middle West is operating on a 24-hr. basis and a maker of planers has put on three shifts. A company manufacturing drill presses produced more machines in June than in any month in its history.

The fact that one or two machine-tool builders have advanced prices is also indicative of a better demand. A shaper manufacturer advanced prices 5 per cent and a multiple drill manufacturer put up prices 10 per cent. One make of milling machines has been advanced 10 per cent. All along the line may be noted a lessening tendency to grant special concessions in terms and prices.

The bulk of current business is in Chicago, Detroit, Cleveland and their vicinity. The East is quite dull.

At Chicago the Standard Oil Co. has closed on a list of general machine-shop equipment for its Whiting, Ind., plant. This inquiry had been before the trade for months. The Victor Mfg. & Gasket Co., Chicago, has bought 20 punch presses and the Midwest Engine Co., Indianapolis, has purchased additional equipment. The Postoffice Department is inquiring in Chicago for about $40,000 worth of tools for 15 garages. A list of 17 machines is put out by the Chicago Pneumatic Tool Co., Chicago, on behalf of the Morris Fertilizer Co.

Orders received by a Cleveland manufacturer of screw machines include 20 for the Crane Co. and 10 for the Western Electric Co., both Chicago. The Studebaker Corporation, South Bend, Ind., is closing on a list of equipment recently issued. Among its requirements are 65 or 70 turret lathes.

In New York an inquiry has been received for about 25 tools for Spain. The Board of Education, Elizabeth, N. J., is asking for bids by July 10 on 15 tools and an electric motor for a vocational school.

Inquiries for 10 electric overhead cranes for Sweden and eight gantry cranes for South Africa are in the market.

Director of Sales C. W. Hare of the War Department has received no official confirmation of cable advices from Europe that La Construction Metallique de Belgique has purchased all of the machine-tool equipment used by the American Expeditionary Forces.

New York

NEW YORK, July 8.

Holiday dullness pervaded the machinery market during the past week. Aside from inquiries for about 25 machine tools for Spain and a list of vocational school equipment for Elizabeth, N. J., there was little of interest in the market.

The Board of Education, Elizabeth, N. J., has issued a list of machine-shop equipment to be purchsaed for its vocational school. Bids are to be submitted by July 10, and deliveries must be made on or before Aug. 16. It is provided that every bid shall be accompanied by a certified check for 25 per cent of the amount of the bid, and sellers are asked to guarantee tools for three years and replace any defective parts. On account of the rigid requirements a number of machine-tool builders and dealers have declined to quote. The list follows:

One 15-h.p. motor, General Electric, or equivalent.
One 15-in. universal shaper, Potter & Johnson, or equivalent.
One Cincinnati No. 1½ universal cone-driven milling machine, or equivalent.
One No. 2 Cincinnati milling machine, or equivalent.
One 6 x 6-in. "Kwik-Kut" power hack saw, or equivalent.
One Wells No. 190 universal cutter and reamer, or equivalent.
One 20-in. Rockford stationary head drill press, or equivalent.
One No. 20 Stanley sensitive drill, or equivalent.
One No. 3½ Stark bench lathe, or equivalent.
Two 12-in. x 5-ft. single back-geared engine lathe, Reed-Prentice, or equivalent.
One 10-in. x 5-ft. single back-geared toolmakers' lathe, Le Blond, or equivalent.
One 16-in. x 10-ft. double back-geared engine lathe, Monarch, or equivalent.
One 16-in. Steptoe crank shaper, or equivalent.

The Standard Oil Co. of New Jersey, 29 Broadway, New York, has inquired for a 28-in. and a 48-in. screw cutting lathe and a wet drill grinder. W. N. Cottrell has succeeded N. W. Porter as purchasing agent of this company.

Crane inquiries are not numerous and few orders are being closed. Two inquiries for export are in the market, one from the Wern Machinery & Engineering Co., 30 Church Street, New York, for 10 overhead bridge cranes for railroad shops in Sweden. Bids are asked on cranes of these capacities: four 5-ton, two 6-ton, one 25-ton, one 30-ton, one 40-ton and one 80-ton. Viele, Blackwell & Buck, exporters, 49 Wall Street, are asking for bids on seven 5-ton and one 10-ton gantry cranes and an overhead bridge crane for shipment to South Africa. A Baltimore builder is reported to have the contract for six or eight cranes for the new sheet mills of the Eastern Rolling Mills Co., Baltimore.

The Hurlburt Motor Truck Co., 8 East Thirty-ninth Street, New York, has been consolidated with the Harrisburg Mfg. & Boiler Co., Harrisburg, Pa. The plant of the latter company will be used in part for the production of Hurlburt trucks, while the Hurlburt plant, Third Avenue and Harlem River, will be continued in operation as heretofore.

In connection with the different building projects to be carried out by State authorities in different cities, a number of new boiler plants will be constructed. Plans for the different structures will be prepared by Lewis F. Pilcher, State architect, Albany, N. Y. The buildings will include a new boiler plant at the Potsdam Normal School, Potsdam, to cost about $100,000; new boilers, stokers and ash handling equipment at the Central Islip State Hospital, Central Islip, to cost $135,000; new boilers at the Normal School, Oneonta, to cost $10,000; generating equipment at the Brooklyn State Hospital, Brooklyn, to cost $15,000; and a one-story and basement vocational school for boys, 40 x 82 ft., at Letchworth Village, Thiells.

The War Department, Washington, is arranging for the purchase of property, now known as Camp Alfred Vail, at Little Silver, near Long Branch, N. J., for a consideration said to be about $125,000. The site will be used as a research and experimental works for radio apparatus.

The Sipp Machine Co., Keen Street and Erie Railroad, Paterson, N. J., maker of warping and winding machinery for textile mill service, is having plans prepared for a two-story addition, 45 x 85 ft., to cost $15,000.

The Hart Roller Bearing Co., 512 Main Street, East Orange, N. J., has awarded contract to the Passaic Steel

Co., Paterson, N. J., for the construction of a one-story building, 30 x 82 ft., at its plant.

The National Asbestos Co., Jersey City, N. J., has been incorporated with a capital stock of $1,500,000, to take over and operate the National Air Cell Covering Co., Henderson Street, Jersey City. The incorporators are A. J. David, Elizabeth, and C. W. Burkhardt, Teaneck, N. J.

The Tidewater Oil Co., Constable Hook, Bayonne, N. J., has acquired a tract, about 600 x 1600 ft., in the Greenville section of Jersey City, for proposed expansion. The property fronts on the National Dock Railroad and extends back to the Morris Canal. The consideration given is said to be about $350,000.

In connection with the proposed new terminal to be established on the west bank of the Arthur Kill River, in the vicinity of Arthur Kill, near Elizabeth, N. J., by the Arthur Kill Terminal Co., New York, equipment will be installed, including hoisting, conveying and handling apparatus; a complete system of railroad trackage will be provided. H. McL. Harding, 52 Vanderbilt Avenue, New York, is consulting engineer on the project, which is estimated to cost in excess of $1,000,000.

The American Aluminum Ware Co., 374 Jelliff Avenue, Newark, N. J., manufacturer of aluminum utensils, etc., has filed plans for its proposed plant on Jelliff Avenue, three stories and basement, 37 x 50 ft., estimated to cost $14,000.

A one-story boiler plant will be erected by the Seton Leather Co., 62 Verona Avenue, Newark, N. J., in connection with a two-story-and-basement works addition estimated to cost $40,000.

The Modern Drop Forge Co., Newark, N. J., has been incorporated with a capital of $50,000 by John G. McKaig, East Orange; A. R. McCloy and P. J. Hannigan, Newark.

George Zisch, Newark, N. J., has filed plans for a one-story brick machine shop, 40 x 80 ft., at 579 Eighteenth Avenue, to cost $5,000.

The Natural Carbonic Gas Co., McClellan Street, Newark, N. J., has filed plans for a two-story addition, 60 x 60 ft., to cost $20,000, including equipment.

E. Poeter & Co., 251 New Jersey Railroad Avenue, Newark, N. J., manufacturers of bag frames, etc., will build a two-story works building, 60 x 100 ft., on Grove Street, Irvington, to be used for die work, plating operations, etc.

A machine repair department will be installed in the automobile service works to be erected by the State Garage Co., Newark, N. J., at 368 Broad Street, near Eighth Avenue. The structure will be 40 x 280 ft., of brick and reinforced concrete, and is estimated to cost $95,000. Edward V. Warren, Essex Building, is architect.

The Overland Rubber Co., Newark, N. J., affiliated with the Willys-Overland Co., Toledo, Ohio, an interest of John N. Willys, has increased its capital from $250,000 to $1,000,000. The company has taken title to the factory recently acquired from the Molitor Corporation at Frelinghuysen and Virginia avenues, and will equip and occupy it for the manufacture of automobile tires. The works will give employment to about 400 persons for initial operations.

The Robert Young Co., New York, has been incorporated with a capital of $10,000 by Robert and F. E. Young and J. A. Bodnar, 173 East Eighty-seventh Street, to manufacture edged tools.

The Steel Equipment Corporation, 25 West Forty-fifth Street, New York, manufacturer of metal furniture, with works at Avernel, near Rahway, N. J., has increased its capital from $700,000 to $1,000,000. The company will build a two-story reinforced concrete addition to its plant, 80 x 160 ft.

The F. B. Potterton Co., New York, has been incorporated with a capital of $10,000 by F. B. Potterton, H. Weiss and A. Hild, 85 St. John Street, to manufacture valves, pipe fittings, etc.

The National Mayonnaise Machine Co., 211 Pacific Street, Brooklyn, N. Y., has increased its capital from $50,000 to $250,000.

The Wilart Instrument Co., New Rochelle, N. Y., has been incorporated with a capital stock of $50,000 by E. W. Nelson, A. Magnuson and A. Berglund to manufacture instruments, tools, etc.

Steinway & Sons, 107 East Fourteenth Street, New York, have completed plans for the proposed two-story metal-working shop addition to their piano manufacturing plant on Riker Avenue, Long Island City. It will be 52 x 98 ft., and is estimated to cost $25,000.

The Jackson Heights Garage Co., Long Island City, N. Y., is having plans prepared by W. S. Worrall, Jr., architect, Bridge Plaza, Long Island City, for a one-story works building, 100 x 105 ft., on Jackson Avenue, near East Twenty-first Street, to cost about $20,000.

Property of the American Industrial Gas Co., 60 Wall Street, New York, will be sold by Francis P. Garvan, Alien Property Custodian, at an early date.

J. P. Warta, Lindenhurst, L. I., is planning the erection of a new machine shop on Wellwood Avenue. It will be equipped for automobile repair work.

The Brooklyn Rapid Transit Co., 85 Clinton Street, Brooklyn, N. Y., has acquired property at the corner of Kent Avenue and South Sixth Street as a site for a new power plant. The property has been held at about $350,000.

The Berggren Engineering Corporation, Brooklyn, N. Y., has been incorporated with a capital stock of $20,000 by G. Berggren, J. Edwards and R. M. Cohen, 1939 Sixty-second Street, to manufacture machinery.

The Mixobeater Machinery Co., New York, has been incorporated with a capital stock of $150 000 by A. J. Polster, H. Trust and F. H. Roth, 145 West Forty-fourth Street, to manufacture special machinery.

The Machinery Merchants, Inc., 50 Church Street, New York, has increased its capital from $100,000 to $250,000.

The Sinclair Oil & Refining Co., 120 Broadway, New York, is said to be planning for a new oil refining plant in the vicinity of New York, to cost about $1,500,000, including equipment. It is understood that the proposed plant will be operated by the Sinclair Consolidated Oil Co., an affiliated organization, of which H. F. Sinclair is president. The company is arranging for an increase in its capital and, it is reported, has called a meeting of stockholders on July 18 for this purpose.

The Multiple Electric Products Co., New York, has been incorporated with a capital stock of $250,000 by J. H. Wallace, A. C. Knoeller and E. Frankel, 700 West 179th Street, to manufacture electrical specialties.

Joseph Gaydica, Brooklyn, N. Y., operating an iron and metal works at 1433 Thirty-eighth Street, is having plans prepared for a one-story brick shop addition, 105 x 180 ft., to cost $60,000, including equipment.

G. F. Richter, 855 DeKalb Avenue, Brooklyn, N. Y., manufacturer of surgical instruments, has incorporated the G. F. Richter Mfg. Co., with a capital of $75,000.

The Schaefer Machine Co., Brooklyn, N. Y., has been incorporated with a capital of $25,000 by G. D. Ackerly, F. M. Livingston and J. G. Williams, 341 St. Johns Place, to manufacture machinery and tools.

Joseph N. Courtade & Sons, Inc., 516 West Twenty-fourth Street, New York, manufacturer of piano cases, has completed plans for its proposed plant on Jackson Avenue, near the Bridge Plaza, Long Island City. Ballinger & Perrot, 1328 Broadway, are the engineers and architects.

The Collins Fireplace Screen Co., New York, has been incorporated with a capital stock of $15,000 by T. F. Walsh, A. V. W. Collins and D. Gray, 80 Edgecombe Avenue, to manufacture screens and other specialties.

The Capital City Plating Co., Albany, will erect a factory, 80 x 80 ft., on Tivoli Street, to cost $20,000, from plans of the M. C. Clausen Iron Co., Albany.

Philadelphia

PHILADELPHIA, July 7.

The Philadelphia Textile Machinery Co., Sixth Street and Tabor Road, Philadelphia, has awarded contract to the Hennebique Construction Co., 1170 Broadway, New York, for the erection of a one-story reinforced-concrete addition, 75 x 240 ft., to cost $50,000.

The General Machine Co., Thompson and Clementine streets, Philadelphia, is planning for a two-story addition, 50 x 147 ft., to cost $10,000.

Following its recent purchase of the rights to the manufacture of the Monash line of valves and pump governors, etc., heretofore produced by the Monash-Younker Co., 121 West Forty-second Street, New York, the Harrison Safety Boiler Works, Seventeenth Street and Allegheny Avenue, has perfected arrangements to produce these specialties under the name of Cochrane-Monash. It is understood that manufacturing will be carried on at the Philadelphia plant.

The Keystone Pure Oil Co., Broad Street, Philadelphia, is planning for a two-story manufacturing plant, 76 x 150 ft., to cost about $40,000, including equipment.

The Niles-Bement-Pond Co., Meadow and Mifflin streets, Philadelphia, has awarded contract for the proposed boiler plant at its local crane works to the Standard Construction Co., 1713 Sansom Street. It will be one story, 44 x 60 ft.

Charles Masover, Philadelphia, operating an iron working plant at Fifth and Clearfield streets, has filed plans for a two-story brick shop, 36 x 40 ft., to cost $8,000.

The Abrasive Co., James and Fraley streets, Philadelphia, manufacturer of grinding wheels, etc., will build a two-story brick addition, 61 x 95 ft., to cost $25,000. F. S. Dickson is president.

The automobile service works of Harry Odenath, 5154-60 Thompson Street, Philadelphia, were destroyed by fire June 28, with loss estimated at $10,000.

The Rockledge Machine Works, Philadelphia, has acquired the business of the New Branson Knitting Machine Co., 3016 East Thompson Street, and will manufacture all machines, repair parts, needles, etc., at its plant heretofore made by the Branson company.

The Wright Roller Bearing Co., Twentieth Street and Indiana Avenue, Philadelphia, has taken out a building permit for the proposed two-story, brick and reinforced-concrete addition to its plant, 27 x 61 ft., to cost $12,000.

In connection with the increase in the appropriation for the Philadelphia Navy Yard, from $1,500,000 to $3,800,000, the additional funds will be used for the construction of buildings, including a machine shop for light work, to cost $400,000; a pattern shop, to cost $400,000; central power plant improvements and electric distributing system, $500,000, and general improvements in facilities and machinery for handling guns, turrets, armor, structural steel, etc., to cost about $1,000,000.

The Lutz Co., Inc., Thirty-first Street and Gray's Ferry Road, Philadelphia, manufacturer of machinery, etc., has awarded contract to the W. H. Baldwin Construction Co., Court House, Camden, N. J., for a one-story pattern shop addition, 48 x 66 ft., to its plant in that city.

The Joseph Stokes Rubber Co., Taylor and Webster streets, Trenton, N. J., manufacturer of hard rubber products, has filed plans for a plant addition, to cost $8,500.

The C. V. Hill Refrigerator Co., Pennington Avenue, Trenton, N. J., manufacturer of refrigerating equipment, is completing the construction of three additions to be equipped for increased capacity. The structures will cost about $50,000. The company is planning to double its business during the present year.

The Quig Brothers-Hudson Motors Co., 52 North Sitgreaves Street, Easton, Pa., has awarded contract to the R. F. & C. D. Stewart Construction Co., Reeder Building, for an automobile service station and repair works, 67 x 115 ft., on North Third Street, to cost $40,000.

Fire, June 26, destroyed the car barns and equipment of the Northwestern Pennsylvania Railway Co., Meadville, Pa., with loss estimated at about $60,000.

The Bennett-Guyer Co., Stroudsburg, Pa., is taking bids for the erection of its proposed one-story automobile and parts manufacturing plant, 74 x 150 ft., estimated to cost $15,000. William Bennett, Record Building, heads the company.

Creasy & Wells, Inc., Bloomsburg, Pa., has been chartered in Pennsylvania with a capital stock of $100,000 to manufacture metal builders' and lumber supplies. The incorporators are S. C. Creasy, E. C. Creasy and D. D. Wright.

Buffalo

BUFFALO, July 7.

The Pierce-Arrow Motor Car Co., Buffalo, has let contract to the Ferguson Steel & Iron Co. for a further addition to its plant at Elmwood and Great Arrow avenues and the New York Central Railroad Belt Line. It will require 200 tons of fabricated steel.

Levering Brothers, Baltimore, Md., and Buffalo, N. Y., foundrymen, have given contract to the Lackawanna Bridge Co., Buffalo, for mill alterations and the erection of a cupola and charging structure of 80 tons capacity at their plant on the Niagara River Road and the New York Central Railroad, River Division, which they recently purchased from the Pierce-Arrow Motor Car Co. Foundry operations at the new plant will begin Aug. 1.

The Art Metal Construction Co., Jamestown, N. Y., has awarded contract to the John W. Ferguson Co., United Bank Building, Paterson, N. J., for the construction of a four-story addition, 100 x 121 ft., to its plant No. 1 at Jones and Gifford avenues.

The Buffalo Bolt Co., Tonawanda, N. Y., has completed plans for an addition to its plant, 81 x 171 ft., at East Avenue, Oliver Street and the New York Central and Erie railroads.

Rice & Adams, 180 Chandler Street, Buffalo, manufacturers of dairy machinery, have filed plans for a three-story addition, to cost about $45,000.

The Root Electric Sign Co., Lockport, N. Y., has been incorporated with a capital stock of $200,000 by A. L. Hoag, C. T. Metzger and I. A. Root, to manufacture electric signs and devices.

The Sterling Aluminum Co., Twenty-sixth and Cherry streets, Erie, Pa., has commenced the construction of a two-story addition, 40 x 160 ft., to cost about $30,000.

The Robertson-Cataract Electric Co., 151 West Mohawk Street, Buffalo, has awarded contract to the Turner Construction Co., Prudential Building, for a six-story works building, 45 x 115 ft., at 128-30 South Elmwood Avenue, to cost $100,000.

Beals, McCarthy & Rogers, Inc., Buffalo, has been incorporated with a capital stock of $1,000,000 by E. J. McCarthy and C. P. Rogers, to manufacture hardware products.

The Watervliet Forge Co., Watervliet, N. Y., has filed notice of dissolution.

The Board of Education, Buffalo, will receive bids up to July 11 for vocational school equipment during the coming year, including machine tools, small tools, electric motors and other equipment. Headquarters of the board are at 1401 New York Telephone Building. William D. Fisher is secretary.

The A. J. Camp Co., Cherry Valley, N. Y., has been incorporated with a capital stock of $25,000 by H. T. Tucker, W. B. Dewitt and A. J. Camp, to manufacture machinery, tools and implements.

The Northwest Foundries Co., Rochester, N. Y., has taken bids for the erection of a one-story addition, 31 x 65 ft. and 31 x 55 ft.

The Ritter Dental Mfg. Co., Rochester, N. Y., operating a plant at 404 West Avenue, for the manufacture of instruments, dental chairs and equipment, has been incorporated with a capital stock of $1,250,000 by H. P. Heath, H. Noble and H. Knight, 348 West Fifty-seventh Street, New York.

The Victor Aluminum Mfg. Co., Wellsville, N. Y., has completed plans for a one-story addition, 32 x 100 ft., to cost $15,000. W. E. Browning is general manager.

The Consumers' Carbide Co., Rochester, N. Y., has been incorporated with a capital stock of $50,000 by J. H. Arnson, T. and M. R. Marsden, to manufacture carbide products.

The Manfred Garage, Inc., Watertown, N. Y., has been incorporated with a capital of $30,000 by N. Manfred, J. Manfred and L. Manfred, 524 Arsenal Street.

Baltimore

BALTIMORE, July 7.

The Porcelain Enamel & Mfg. Co., O'Donnell and Eighth streets, Baltimore, is taking bids for a proposed one-story addition, 100 x 110 ft., to cost $15,000.

Fire June 29 destroyed the plant of the Armour Fertilizer Co., Key Highway and Allen Street, Baltimore, with loss, including equipment, estimated at $700,000.

Price Brothers, East Patrick Street, Frederick, Md., have awarded a contract to Lloyd C. Culler, Knights of Pythias Building, Frederick, for a one-story machine shop and foundry, 37 x 160 ft., at Second and Church streets, to cost $18,000.

The Bureau of Yards and Docks, Washington, has awarded a contract to the Hughes-Foulkrod Co., Commonwealth Building, Philadelphia, for the construction of 12 buildings at the naval works at Quantico, Va., to cost about $206,000. The bureau will also be in charge of the construction of the proposed new naval experimental laboratory to cost about $1,500,000, including equipment. The Advisory Board, Navy Department, has suggested that this new plant be located at Annapolis.

The Central Chemical Co., Baltimore, is considering the establishment of a plant for the manufacture of fertilizers at Harrisonburg, Va., the proposed works to be fully equipped to handle all features of manufacture, including grinding, mixing, etc.

Frank M. Krasmer, Dauphin Street, Baltimore, is having plans prepared for a two-story machine and auto repair shop, 26 x 78 ft., to cost $6,000.

Mechanical equipment, including boiler, engine, power plant and general operating apparatus, will be installed in the new plant of the Salisbury Ice Co., Salisbury, Md., to replace the works recently destroyed by fire with loss estimated at $65,000.

The plant of the Maryland Shipbuilding Co., near Baltimore, has been sold to the Emergency Fleet Corporation. It is understood that the yards will be used for general repair work. The company was organized in 1917 by J. E. Aldred and others with an authorized capital stock of $1,000,000. There are four berths, with traveling electric cranes and other equipment.

The first unit of the plant to be built by the Canion Air Brake Co., 563 Calvert Building, Baltimore, will be a two-

story, reinforced concrete machine shop, 60 x 200 ft. R. Schoenwetter and C. A. Zarobsky are the engineers.

The Metal Mfg. Co., Roanoke, Va., has increased its capital stock from $10,000 to $25,000.

The Craven Foundry & Machine Co., Newbern, N. C., will build a machine shop and foundry.

The plant of the Universal Plow Co., Florence, S. C., which was recently burned, will be rebuilt.

Chicago

CHICAGO, July 7.

The fact that deliveries are becoming a problem indicates that the aggregate amount of business done in the last month or two was considerable. Some sellers have lost orders because they could not deliver machines promptly. That tool manufacturers are doing all they can to remedy this condition is evidenced by reports from various plants. A milling machine manufacturer is operating 24 hr. a day, a maker of planers has put on three shifts and a manufacturer of drill presses produced more machines in June than in any similar period in its history.

Inquiries continue numerous and individual purchases are no longer so largely for one or two machines. The Standard Oil Co. has closed on a list of general machine shop equipment for its Whiting, Ind., plant, which had been before the trade for several months. The Victor Mfg. & Gasket Co., 1956 Troy Street, Chicago, has ordered 20 punch presses, and the Midwest Engine Co., Indianapolis, Ind., has purchased additional equipment. The Nash Motors Co., which has been buying tools almost every week, purchased a planer and a number of special machines. The United States Post Office Department has been inquiring for about $40,000 worth of tools for 15 garages in the Middle West, and has ordered equipment for one. The remaining requirements may be covered by purchases of tools on sale by the Government, if suitable machines can be found. The Chicago Pneumatic Tool Co. has circulated a list on behalf of the Morris Fertilizer Co., Atlanta, Ga., including the following:

One 14-in. gear head lathe with 6 or 8 ft. bed and four-jaw chuck.
One radial drill.
One 24-in. lathe with 12-ft. bed and four-jaw chuck.
One power hack saw.
One 26-in. shaper.
One universal milling machine.
One 200-ton wheel press.
One floor crane.
One 4-in. bench vise.
One 5-in. bench vise.
One 6-in. bench vise.
One small arbor press.
One 6-in. blacksmith's vise.
One blacksmith's anvil with 6-in. face.
One set of taper shank twist drills, size 1/16 in. to 1 in. by 1/64 in.
One set of taper shank twist drills, size 1 in. to 2 in. by 1/32 in.
One pipe threading machine.

One shaper manufacturer has increased his prices 5 per cent, and a maker of multiple spindle drills recently announced a 10 per cent advance.

Printing press manufacturers in this district are very busy and are ordering machine tool equipment from time to time. Within the last month one company has purchased five radial drills and five turret lathes.

Building permits taken out in Chicago in the first six months of this year exceeded the number granted in the same periods in 1918 and 1917. The number of buildings authorized was 3225, involving a total cost of $34,540,350.

R. E. Ellis, president of the R. E. Ellis Engineering Co., 621 Washington Boulevard, Chicago, has retired from active service with the company and has disposed of his interests to Frederick Fisher, vice-president and treasurer. The firm represents the Hannifin Mfg. Co., the Murchey Machine & Tool Co., the Kelly Reamer Co., the McCroskey Tool Corporation, the Hoefer Mfg. Co., and a number of other manufacturers.

The Walden Shaw Taxicab Co., 1006 Wabash Avenue, Chicago, contemplates the erection of a large plant for the manufacture of motor trucks and taxicabs on 96 acres of land on the northwest side of the city, the purchase of the site being practically consummated. According to present plans the plant will be completed by Nov. 1, and will have an output of 2000 trucks and 1500 taxicabs a year.

Contracts have been awarded for the construction of a three-story and basement addition to the plant of the Benjamin Electric Co., Des Plaines, Ill., at an estimated cost of $180,000.

Bids are being taken on a factory to be built for the Knight Light & Soda Fountain Co., formerly the Knight Light Co., at Kildare and Schubert avenues, Chicago. The plant will comprise a three-story building, 77 x 210 ft., and a one-story saw-tooth structure, 163 x 198 ft., to cost $150,000.

The Seng Co., manufacturer of furniture hardware, Chicago, is having plans drawn for a factory at the northwest corner of Diversey Boulevard and North Crawford Avenue. The plant will comprise several one, two, three and four story units. The first unit will cost $750,000 and the entire project about $1,500,000.

The Grip Nut Co., Chicago, has awarded a contract for the foundation of a 100 x 300 ft. plant at 5901 to 5923 Southwestern Avenue.

The Mather Spring Co., Toledo, Ohio, has leased a one-story building, 70 x 120 ft., to be erected at 232-238 East Ontario Street, Chicago.

The Robertson Brothers Mfg. Co., manufacturer of steel pipe, has purchased the factory of the Accurate Engineering Co. at South Western Avenue and Fifty-fourth Street, Chicago. The plant comprises one-story buildings containing about 45,000 sq. ft. of floor space.

Albert Pick & Co., manufacturers of cooking apparatus and metal novelties, 212 West Randolph Street, Chicago, contemplate the erection of a five-story addition, 112 x 256 ft., to cost $400,000.

C. H. Fisk, 1581 Ogden Avenue, Chicago, has awarded a contract for the construction of a machine shop addition.

The Charles F. Elms Engineering Works, Chicago, will take bids soon on a one-story addition, 50 x 100 ft., to cost approximately $12,000.

The Rockford Brass Works, Rockford, Ill., is reported to have changed hands.

The Root & Van Dervoort Engineering Co., East Moline, Ill., manufacturer of automobile and tractor engines, has increased its capital stock from $1,346,200 to $7,500,000. An increase in manufacturing facilities is contemplated. With this end in view a tract of 61 acres adjoining the plant was recently purchased.

The Standard Metal Products Co., Rock Island, Ill., was recently incorporated with a capital stock of $30,000.

The Continental Motors Corporation, Muskegon, Mich., will add 125 ft. to its present saw-tooth plant and will erect a new power plant. The improvements will cost about $20,000.

The Lightning Change Rim Co., manufacturer of a new type of automobile rim, Berrien Springs, Mich., recently incorporated, contemplates erecting a plant soon.

The Dare Aircraft Co., Muskegon, Mich., has been incorporated with a capital stock of $125,000 to manufacture aircraft parts and accessories.

Heinecke & Co., manufacturers of agricultural implements, Springleld, Ill., will erect a $15,000 addition between Eighth and Ninth streets.

John Klein has awarded a contract for the construction of a one-story plant for the manufacture of linemen's tools at 3200-3236 Belmont Avenue, Chicago, at an estimated cost of $30,000.

The Simplex Short Turn Trailer Co., Lagro, Ind., has been incorporated with a capital stock of $100,000, and plans the erection of a plant. Work will be started on the first unit, 40 x 150 ft., within the next two weeks.

The Buescher Band Instrument Co., Elkhart, Ind., will build a 108 x 132 ft. addition to its plant.

The Des Moines Foundry & Machine Co., Des Moines, Iowa, has been incorporated with a capital stock of $100,000, and expects to build a plant in the near future.

The Linograph Co., manufacturer of typesetting machines, Davenport, Iowa, plans the construction of a five-story factory, 65 x 150 ft., to cost about $100,000.

The Farm Motors Co., Minneapolis, Minn., has been incorporated with $2,500,000 capital stock to manufacture gas engines, tractors, automobiles, trucks, railroad cars and other vehicles. The incorporators include Carl M. Sholin, president, Milaca, Minn.; Charles A. Dammerell, secretary and treasurer, Chicago; W. R. Donaldson and L. D. Sheely, Chicago, and R. P. Carleton, Minneapolis.

The Seal Tite Piston Ring Co., Minneapolis, Minn., has increased its capital stock from $100,000 to $200,000.

The Crowe Name Plate Co., Chicago, has filed plans for the erection of a new one-story plant at 3741-47 Ravenswood Avenue, to cost about $35,000.

The Express Body Corporation, Shields Avenue, Crystal Lake, Ill., manufacturer of automobile bodies, has broken ground for the construction of a new one-story plant, 100 x 200 ft., to cost about $75,000, including machinery and equipment installation.

Bunte Brothers, 730 West Monroe Street, Chicago, will build a new two-story and basement machine shop, 75 x 125 ft., on the Franklin Boulevard, near the line of the Chicago & Northwestern Railroad. It will be used for automobile parts manufacture, repair work, etc.

The Blackhawk Tire & Rubber Co., Locust Street, Des Moines, Iowa, has completed plans for the erection of its proposed new two-story and basement manufacturing works, of brick and reinforced concrete, 87 x 214 ft., estimated to cost $60,000, including machinery. Sawyer & Waterous, Heppe Building, Des Moines, are the architects.

The Chicago & Northwestern Railroad, Chicago, is planning for the construction of a new power plant at Clinton, Iowa, to be erected in connection with a new passenger station.

The Ursus Motor Co., Chicago, manufacturer of automobile trucks and tractors, has arranged for the purchase of about 16 acres at Grand and Fullerton avenues, at a cost of about $65,000. The site will be used for the erection of a new plant.

New England

BOSTON, July 7.

New England machinery dealers are satisfied with their market as it has developed in the past two or three weeks. The improvement has been a decided one, and it comes from a wide diversity of industry. On certain types and sizes deliveries can no longer be immediate. A recent order for a large radial, needed quickly, could not be taken for delivery earlier than October. With some of the milling machines similar conditions exist, these having come within the month. Much of the present buying is from the automobile trade and there is a feeling that the requirements of these works will be largely attended to after a little while. But general business will make up from any falling off of orders from this particular field, in the opinion of the dealers.

The pressed metal manufacturing plants are becoming very busy, a fact which reflects itself in the machinery trade, because a good deal of machinery is being bought by these companies.

The disposal of Government-owned machine tools, the left-overs of the war, is apparently having no detrimental effect on the market for new machinery. The fact is that much of this equipment is being absorbed by the Government itself, particularly in its arsenals, which in the past have never been properly equipped, in that much of their machinery was not strictly modern and the shops have been ill balanced. Dealers believe that to a certain extent the Government has been impelled to make use of the surplus machinery as a result of the attitude of its agents as to values. They assert that in some cases bids for machinery have been rejected as too low, which naturally leaves it still in the possession of the Government. Rather than accept a price they considered too low the officials in charge have looked about for the opportunity to make a more profitable use of the machinery, and as a result it has been placed in Government plants.

Nevertheless, the Government is buying new machinery. An instance is that of the Navy Department which, previous to July 1, sent out telegraphic requests asking immediate figures on invitations for bids already outstanding, in order that contracts might be placed before the close of the fiscal year ending with June, the idea being that available appropriations for the year might be taken advantage of, instead of being carried over and possibly lost.

The Massachusetts Machine Shops, Inc., manufacturer of metal stampings, has removed its business from Worcester, Mass., to 817 Albany Street, Boston, where it will be housed in the same building as the A. A. Knights & Son Corporation, manufacturer of bakers' supplies, with which it is closely associated in ownership.

The Hemphill Mfg. Co., Central Falls, R. I., manufacturer of knitting machinery, has awarded a contract to the Humes Construction Co., 76 Dorrance Street, Providence, for the erection of a two-story and basement machine shop, 38 x 153 ft., with wing extension, one-story, 25 x 48 ft., to connect with the main building. A one-story forge shop 38 x 189 ft., will also be erected.

A power plant, 30 x 40 ft., will be erected by the Rhode Island Silk Co., Westerly, R. I., in connection with its proposed new mill to cost about $125,000.

The Corbin Screw Corporation, New Britain, Conn., a division of the American Hardware Corporation, has awarded a contract to the James H. Grozier Co., Hartford, Conn., for the erection of a six-story addition, 60 x 120 ft., to cost about $90,000.

The New England Savoid Tire Co., Boston, Mass., a Delaware corporation, manufacturer of automobile tires, has increased its capital from $3,000,000 to $4,000,000.

The War Department, Washington, has awarded a contract to the E. D. Ward Co., 82 Foster Street, Worcester, Mass., for alterations, improvements and additions to several buildings at the Watertown, Mass., Arsenal, to increase the present capacity in the mechanical department. The work will consist of a one-story upper addition to the press shop, and a similar extension to the forge shop. New walls will be placed in the hardening shop to permit the installation of an electric traveling crane. The machine shop will be remodeled to allow for the installation of heavier machinery and at the same time increase the capacity. A new concrete storehouse, 78 x 500 ft., will also be erected. It is expected to have all the work completed in about four months, allowing for the installation of additional machinery and equipment about that time.

The Clover Mfg. Co., Norwalk, Conn., manufacturer of grinding compounds, etc., has awarded a contract to the Austin Co., 217 Broadway, New York, for the erection of three new plant buildings at Winnipauk, Conn. The structures will be brick and concrete, averaging 465 ft. long and 40 to 90 ft. wide.

The Ware Foundry Co., Ware, Mass., is planning to acquire the former power plant of the Ware Electric Co., on the Ware River, as an extension. It is planned to build an addition to the present structure, in connection with remodeling and improvement work. The company's plant is on Eddy Street and it is proposed to remove this to the new location.

Cleveland

CLEVELAND, July 7.

The demand for screw machines has been more active the past week. The Crane Co. and the Western Electric Co., Chicago, placed orders with a Cleveland manufacturer, the former for 20 machines and the latter for 10 machines. The Studebaker Corporation is now placing orders for a large amount of machinery, for which it recently issued a list. This includes 65 or 70 turret lathes, which have not yet been placed. The holiday period interfered somewhat with the volume of business last week, and dealers notice a little easing up in the demand, but state that business is up to normal for this season of the year. Lists of any size are lacking, but dealers are getting a good volume of orders for single machines and for lots up to two or three. The Timken Roller Bearing Co., Canton, purchased a few machines the past week for its Columbus, Ohio, plant. The Marion Steam Shovel Co. has not bought on its list noted last week. The automobile industry still furnishes the bulk of the business, but some is coming from steel plants. The Chandler Motor Car Co., the Buick Motor Co. and the Ford Motor Car Co. are buying additional equipment.

Deliveries on the larger types of machines not usually carried in stock, particularly lathes, boring mills and planers, are getting further behind. Some planer manufacturers are now unable to take orders for shipments before October or November. Deliveries on some milling machines are also slow, although other types of these can still be had from dealers' stocks. One dealer of milling machines has advanced prices about 10 per cent. The demand for used machinery is active.

Builders of steel plant equipment and mining machines report some good inquiries and expect to book orders shortly. The demand for locomotive cranes increased slightly the past week.

The demand for twist drills has improved recently, although manufacturers state that there are still large stocks of resale drills on the market. These are being offered by plants which purchased them for war work, some holding the drills for fair prices and others offering them at very low prices. Manufacturers expect that it will take several months to entirely absorb these surplus stocks. It is understood that the Government still has large stocks of twist drills to dispose of. The material disposal department of the Bureau of Aircraft Production of the War Department has under consideration the matter of the disposal of drills owned by that department, and plans to sell these shortly

at prices that will not cause a demoralization of the market.

The Electric Vacuum Cleaner Co. has taken over the plant and business of the Frantz Premier Co., Cleveland, and the electric vacuum cleaner department of the Edison Electric Appliance Co., Chicago. The new company was recently incorporated for this purpose, and has a capital stock of $1,400,000. It is affiliated with the General Electric Co. Julius Tuteur is president; F. S. Hunting, vice-president; E. W. Miner, treasurer, and A. B. Cannon, secretary.

The Parish & Bingham Co., Cleveland, has placed a contract for the erection of a two-story addition, 30 x 88 ft.

The Foster Bolt & Nut Co., Cleveland, has placed a contract for the erection of a two-story addition, 30 x 88 ft.

The Cleveland Milling Machine Co., Cleveland, has appointed the General Tool & Supply Co., Saginaw, Mich., to represent it in that district. The company will carry a stock of the Cleveland milling machines and milling cutters.

The new plant to be erected in Columbus, Ohio, by the Timken Roller Bearing Co., Canton, will include a main factory building, 300 x 600 ft., and two other buildings, 60 x 150 ft., and 80 x 150 ft., respectively. The plant will be located on a 15-acre site, allowing room for expansion. It is announced that the company will spend between $1,000,000 and $1,500,000 on the buildings and equipment. All the mechinery has been ordered and the plant is expected to be in operation within 60 to 90 days. About 1000 men will be added to the payroll.

The Arctic Ice Machine Co., Canton, Ohio, has taken bids for the erection of a one-story machine shop, 100 x 250 ft.

The Falls Rivet Co., Kent, Ohio, plans to build a large extension, on which work will be started in the early fall.

The Sterling Machine & Stamping Co., Wellington, Ohio, has placed a contract for the erection of an aluminum foundry.

The A. M. Mayle Mfg. Co., Toledo, recently incorporated with a capital stock of $20,000, will build a plant near that of the Doehler Die Castings Co. for the manufacture of dies, jigs and other products. Albert M. Mayle is at the head of the company.

The Ohio Steel Foundries Co. is making extensive improvements to its Bucyrus, Ohio, plant, involving an expenditure of between $75,000 and $100,000.

The Perfect Rubber Co., Mansfield, Ohio, has been incorporated with a capital stock of $100,000, and will build a plant for the manufacture of rubber products. C. H. Voegele is president and J. M. Pitney secretary and treasurer.

The Lake Erie Bolt & Nut Co., Cleveland, which was recently organized to take over the Lake Erie Iron Works and of which Norris J. Clarke is president, has completed its organization. Richard Inglis is vice-president and H. C. Volmer secretary and treasurer. The directors, in addition to the officers, include E. D. Rogers, Charles W. Scofield, formerly secretary and treasurer, Harold T. Clarke and Chester C. Bolton.

Cincinnati

CINCINNATI, July 7.

Machine-tool builders who attended the joint convention of the Master Car Builders and the Master Mechanics at Atlantic City last month returned home much impressed with the great need of the railroads for shop equipment. However, orders from this source are very few in number. Instances are cited where machines nave been recommended by the shop departments, but evidently the purchasing departments are handicapped in getting the requisitions through promptly. Medium-sized boring mills are in heavy demand from tire manufacturers all over the country. Automobile manufacturers have also recently placed some fair-sized orders for lathes. Export business to England is holding its own and recently a few orders have been received from Spain. No recent sales to Italy have been reported. Orders for machine tools to be shipped to Belgium have recently fallen off considerably and it is understood that quite a number of Government owned machines will be shipped to that country.

The Pacific Coast furnishes several recent orders for portable electric drilling and grinding machines.

On account of the increased cost of castings and the present high rate for labor, rumors are in the air that some concerns will advance their quotations on various machine tools. Shaping machines will probably be the first ones affected, as some severe reductions were made on these by nearly all makers.

The Precision Equipment Co., Cincinnati, has been incorporated with $40,000 capital stock by John L. Gates and others. It has temporary quarters at 2437 Gilbert Avenue and will specialize in wireless equipment and later on engage in the manufacture of spark plugs. Practically all the necessary machinery has been purchased.

Haberer & Co., Cincinnati, manufacturers of automobile bodies, has acquired additional manufacturing space and will increase its present output.

The Ohio Veneer Co., Cincinnati, will make an addition to its plant at 2624 Colerain Avenue, estimated to cost $10,000.

Architects Tietig & Lee, Cincinnati, have awarded contracts for an addition to the plant of the John Douglas Co., Cincinnati, estimated to cost $75,000. The company manufactures plumbing supplies.

The plant of the Standard Electric Tool Co., Cincinnati, was slightly damaged by fire last week. No let-up in manufacturing operations resulted.

The Dayton Steel Co., Dayton, Ohio, recently incorporated with $125,000 capital stock, has purchased the plant of the Dayton Structural Steel Co. and will equip it for fabricating structural steel. J. A. Berger, president Berger Steel Co., Akron, Ohio, is president of the new company.

The Master Tire & Rubber Co., Dayton, has been incorporated with $300,000 capital stock by W. B. Ruston and others. Plans have been prepared for a six-story fireproof factory, work on which is expected to commence at an early date. The offices of the company are in the Schwind Building.

The Trump Mfg. Co., Springfield, Ohio, will erect a pattern shop addition to its plant, 35 x 70 ft., one story, and of fireproof construction.

The Star Foundry Co., Troy, Ohio, is having plans prepared for additions to its plant that will double its present capacity.

The Shartle Machinery Co., Columbus, Ohio, has been incorporated with $10,000 capital stock by George W. Shartle and others.

D. E. Howell, Lewisburg, Ohio, has started work on a plant to be used for the manufacture of cement, tile and blocks.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, is contemplating an addition to its plant to be used in the manufacture of refrigerators.

The Dockery Brass & Iron Co., Zanesville, Ohio, has been purchased by Louis H. Wise, one of its stockholders. The business will be operated under the same name and later extensions to its foundry and machine shop are contemplated.

The Delker Brothers Buggy Co., Henderson, Ky., will erect an addition to its plant that will give it 25,000 sq. ft. more floor space.

The Casey-Hedges Co., Chattanooga, Tenn., is increasing the capacity of its plant by the installation of additional boiler-making equipment. T. H. Johnson is vice-president and general manager.

The plant of the Union Fork & Hoe Co., Columbus, Ohio, was damaged by fire June 25. Rebuilding operations are already under way.

The Kingsport Garage Co., Kingsport, Tenn., has been organized by Alfred Vaksdal and others and will establish a shop for repairing automobiles and handling general machine shop work.

The Reliable Tractor & Engine Co., formerly the Reliable Engine Co., Portsmouth, Ohio, has been incorporated with a capital stock of $2,000,000 to take care of its rapidly growing business. The incorporators are Chris Heer, president; F. E. Adams, George W. Platt, F. N. Tynes and M. Heer.

Milwaukee

MILWAUKEE, July 7.

The first week of July has been so broken up by an unusually extended holiday that sales as well as production of machine tools were limited. However, the nature and volume of inquiries received in the past week indicate an excellent business for the month. While there are only a few lots of considerable size before the trade, a number are included in the inquiries received. The bulk of orders consists of single tools or small lots, the aggregate of which furnishes quite a satisfactory volume and will keep shops busy for several months to come.

The Koehring Machine Co., Milwaukee, manufacturer of concrete mixers and paving outfits, has plans for a one-story brick and steel erecting shop, 75 x 326 ft., embracing also a new office building, at its main works at Thirty-first Street and Concordia Avenue. Bids are now being taken by Van Ryn & DeGelleke, architects, Caswell Block. A miscellaneous

of crane and fixture equipment is being purchased. William J. Koehring is president.

The Reliance Motor Truck Co., Appleton, Wis., manufacturer of motor trucks and external spur gear drive axles, has increased its capital stock from $500,000 to $1,000,000 to accommodate the growth of its business and to provide additional facilities. Plans are being prepared for a four-story brick, concrete and steel machine shop and assembling floor, 70 x 300 ft., which will cost about $100,000, with an additional investment of $50,000 on new machine tools and other equipment. Work probably will not begin until some time in August. John M. Balliet is president and general manager.

The Wausau Foundry & Machine Co., Wausau, Wis., has been reorganized and the capital stock increased from $15,000 to $30,000. J. M. Howarth of Wausau and associates have acquired the interests of the estate of Albert Kraatz and of Louis and Karl Kraatz. Mr. Howarth has been elected president and general manager. The company will do a general foundry and machine shop business and will specialize in the manufacture of core machines, hog oilers, cookers and other equipment for the paper and pulp and sawmill industries.

The Economy Carbureter Co., Milwaukee, has been incorporated with a capital stock of $50,000 to manufacture vaporizers and other devices for internal combustion engines. The incorporators are Eugene Drahonovsky, Joseph Stoll and Ray Huelsbeck. A factory will be established, but for the present the company will purchase its brass and other castings.

Schlueter & Kakuske, Janesville, Wis., have opened a machine and boiler shop and repair works at 111 North Jackson Street.

The Antigo Tractor Co., Antigo, Wis., has been incorporated with a capital stock of $100,000 to manufacture gas and kerosene tractors, motor trucks, etc. The incorporators are William H. Wolpert, Charles J. Hanzel and D. S. Stewart, all of Antigo. The company will manufacture a farm and general purpose traction machine of the four-wheel drive type designed by Mr. Stewart, who retired some time ago fro mthe Topp-Stewart Tractor Co., Clintonville, Wis. Richard Koebke, Antigo, is secretary.

The H. R. Prange Co., Sheboygan, Wis., has engaged W. C. Weeks, local architect, to design a public garage and repair shop, two stories and basement, 60 x 85 ft. The second floor will be equipped as a machine shop. H. B. Bitter is secretary.

The Appleton Engine Works, Appleton, Wis., on July 1 moved from 580 Superior Street to its new machine shop at 1019 College Avenue. The concern manufactures gas engines and does general engine and machine repair work. Considerable lathe and other tool equipment has been acquired. M. Heineman and R. E. Schwerke are the proprietors.

The Wald Mfg. Co., Sheboygan, Wis., manufacturer of bicycle parts and automotive specialties, will build a four-story addition, 40 x 110 ft., and rebuild its present shop. The work will cost about $30,000.

The Draeger-Corbett Machinery Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture machinery. Arnold H. Corbett, George Katz, attorney, 314 Wells Building, and T. E. Dorn are the incorporators.

The Recordeon Phonograph Co., Milwaukee, has filed articles of incorporation. The capital stock is $100,000 and the purposes to manufacture reproducing instruments. The incorporators are Edward A. Heaney, Walter H. Schwab and Michael Levin, attorney, Caswell Block. The former plant of the American Auto Body Co., defunct, at North Milwaukee, has been acquired and is being equipped.

E. E. Rogers, Pabst Building, Milwaukee, will award contracts this week for the erection of a three-story brick and reinforced concrete building, 120 ft. square, at Milwaukee and Huron streets, leased for 10 years to the Post Office Department as a garage and maintenance shop for the fleet of motor trucks installed July 1 for the Milwaukee Post Office. The building will contain a machine shop, 60 x 120 ft., and other service, maintenance and storage departments. Frank B. Schutz is postmaster.

The Board of Education, Chetek, Barron County, Wis., has engaged W. L. Alban, architect, 347 Endicott Building, St. Paul, Minn., to prepare plans for a new high school, with vocational training departments, estimated to cost $75,000.

The Fox River Tractor Co., Appleton, Wis., a new corporation with a capital stock of $200,000, is erecting a one-story brick shop, 40 x 72 ft., as the first unit of its new plant to be situated on a four and one-half acre tract at Commercial and Rankin streets. The shop will be used for assembling. Early next spring it is proposed to erect a two-story plant, 120 ft. square. Frank Saiberlich is president and chief engineer.

William Loeffler, 826 St. Claire Avenue, Sheboygan, Wis. manufacturer of special metal and wood-working machinery, took occupancy of his new machine shop, 40 x 80 ft., at South Seventeenth Street, on July 5. New equipment to double the facilities has been installed.

George Chamberlain, Waukesha, Wis., and L. E. Delworth, Minneapolis, have formed a partnership as the Chamberlain & Delworth Repair Co., and will open a commercial machine shop at St. Paul Avenue and Mary Street, Waukesha. Equipment is being purchased.

The Peshtigo Pulp & Paper Co., Peshtigo, Wis., organized with a capital stock of $500,000, has plans for a new paper mill, with separate power plant, to cost $250,000. The principal items of equipment will be two 132-in. machines for making tissue and light wrapping stock. Samuel Woodward is secretary.

Pittsburgh

PITTSBURGH, July 7.

The Russel Machine Co., Pittsburgh, has been chartered with a capital stock of $100,000 by Charles J. Lang, Wilkinsburg, Pa.; Edward J. Lang, Wilkinsburg, Pa.; Jennie W. McMorran, Aspinwall, Pa., to manufacture machinery, mill and machine supplies.

The Pittsburgh Carbon Brush Co., Pittsburgh, with a capital of $60,000, has been chartered by Raymond Hausen and others to manufacture mechancial appliances, electrical, carbon and chemical supplies.

The Grant Garage & Service Co., Pittsburgh, recently organized, has been chartered with a capital stock of $50,000 by Thomas Yohe, 205 Grant Street; Gustave A. Yeager, 4029 Butler Street, and Louis Modispacher, 5125 Penn Avenue.

The Homestead Valve Co., Homestead, Pa., has awarded contract to the Austin Co., Union Arcade, Pittsburgh, for a one-story foundry, 27 x 40 ft., on Sixth Street, to cost about $10,000.

The Hollingsworth Knife Co., Kane, Pa., is having plans prepared for a two-story and basement addition, 40 x 80 ft., to cost $20,000. H. Hollingsworth is president.

The West Virginia Light, Heat & Power Co., Sisterville, W. Va., has been incorporated with a capital stock of $75,000 by T. C. Davidson, A. R. Ten Broeck and A. D. Lord to operate a local electric power plant.

The Damascus Bronze Co., 928 South Avenue, Pittsburgh, is taking bids for a three-story and basement works, 66 x 75 ft., at Leetsdale and Sturgess streets.

Indianapolis

INDIANAPOLIS, July 7.

The Collapsible Auto Rim Adjustable Tool Mfg. Co., Indianapolis, has been incorporated with a capital of $100,000. The directors are Edward H. Bauman, Dave Yover and Paul P. Scharffin.

The Superb Mfg. Co., Monticello, increased its capital stock from $10,000 to $30,000.

The plant of the Indestructible Wheel Works, Lebanon, Ind., was recently damaged by fire to the extent of $5,000.

The American Dehydrator Corporation, Gary, Ind., has been incorporated with a capital stock of $1,000,000, to manufacture dehydrating machinery. The directors are Horace S. Norton, Ingwald Moe, Chester E. Wirt, William F. Hodges and Oscar T. Gregory.

The Wayne Belting & Supply Co., Fort Wayne, has increased its capital stock from $25,000 to $75,000.

The H. P. Johnson Mfg. Co., Indianapolis, has been incorporated with a capital stock of $50,000 by Hans P. Johnson, Racine, Wis., inventor and patentee of a new type of railroad joint which will be manufactured at Indianapolis. Christ Sorenson and C. W. Johnson, also of Racine, are associated in the project. Mr. Johnson conducted a machine shop at Racine for many years and is moving this business to Indianapolis to form the nucleus of a larger plant which will specialize in the manufacture of the joint.

Cecil G. Fowler, vice-president National Fowler Bank, Lafayette, Ind., and James K. Risk have bought the Dairy Queen Separator Co., Lebanon, Ind., of which Mr. Risk has been general manager for the last three years. The company has been reorganized under the same name with

$420,000 capital stock. The directors are Cecil G. Fowler, James K. Risk and Paul Honan.

The McGill Mfg. Co., Valparaiso, Ind., has increased its common stock from $20,000 to $500,000 and its preferged stock from $20,000 to $500,000.

The Michigan City Foundry & Machine Co., Michigan City, Ind., which has just completed its gray iron castings foundry, has let a contract for a $25,000 malleable castings foundry.

The Drop Forge Co., Marion, Ind., has filed with the Indiana Secretary of State articles of dissolution.

St. Louis

ST. LOUIS, July 7.

The Shreveport Brick & Tile Co., Shreveport, La., will add about $50,000 worth of new equipment to increase its output.

The Batesville Compress Co., Batesville, Ark., capital stock $50,000, G. E. Yeatman president, is reported in the market for cotton compress equipment.

The Loose Roll Gin Co., Fort Smith, Ark., capital stock $100,000, C. B. Cotton, Dardanelle, Ark., president, is reported in the market for ginning and power plant machinery.

The City Commissioners, Monroe, La., are preparing plans for an electric power station, to cost about $2,000,000. Walter G. Kirkpatrick is consulting engineer.

The Commonwealth Public Service Corporation, Fort Smith, Ark., has plans for a $200,000 electric generating station with steam turbine engines at Clarksville, Ark.

The Charity Hospital, New Orleans, La., M. R. Mathews secretary, will install an isolated electric light plant, to cost about $90,000.

O. J. Southworth and others of Blytheville, Ark., will equip a machine shop requiring about $12,000 worth of machinery.

The Indiahoma Refining Co., Okmulgee, Okla., has increased its capital from $1,300,000 to $3,000,000 to extend its refining facilities.

The St. Louis Metal Ware Co., St. Louis, will equip a building 250 x 450 ft. for the manufacture of steel barrels, automobile hoods, etc.

The National Metal Die Mold Co., St. Louis, Herman C. Stifel president, 207 North Broadway, will equip a plant for the manufacture of metal dies.

The Hinderliter Tool Co., Tulsa, Okla., will equip a tool-making plant. Engines and other machinery are wanted.

The Aluminum Ore Co., St. Louis, will equip a mechanically operated loading dock at Baton Rouge, La., for handling ore from Honduras, and will also build a plant for refining the ore.

Fire last week in the two-story machine shop of the Colcord-Wright Machinery & Supply Co., 1223 North Broadway, St. Louis, caused damage estimated at $28,000. J. W. Wright is president.

Texas

AUSTIN, July 5.

The State Refinery Association, Dallas, has purchased a site near Dublin upon which it will construct an oil refinery. Shearon Bonner is president.

The American Iron & Metal Co., Dallas, has been incorporated with a capital stock of $50,000. The incorporators are M. Feldman, John Garnett and Sam Kruger.

The Matagorda Gin Co., Bay City, will build a cotton gin, to cost about $28,000. Frank Heubner of Bay City is a stockholder.

The Humble Oil & Refining Co., Houston, will build machine shops, erect a warehouse and make other improvements at Cisco.

The Allied Oil & Gas Co., Mineral Wells, will construct a pipe line between Fort Worth and Mineral Wells, a distance of 101 miles.

The Howard Tool Co., Eastland, will construct a machine shop, to cost $30,000. It will be equipped to do all kinds of oil field machinery repair work and will carry a complete stock of oil field drillers' supplies.

The Star Filling Station Co., Fort Worth, has been incorporated with a capital of $150,000, and will build four gasoline filling stations in that city. It will also build an oil refinery with a daiy capacity of 1000 bbl. W. A. Harrison, Fort Worth, is president.

The Beaver-Electra Refining Co., Electra, will increase the capacity of its oil refinery from 1500 to 5000 bbl. per day.

The Texas Gulf Refining Co., Oildom, which is constructing oil refineries at Fort Worth, Abilene and Oildom will lay a pipe line from Ranger to Abilene, a distance of 66 miles.

Canada

TORONTO, July 5.

The Carmichael Waterproofing Co., Ltd., Toronto, Ont., has enlarged its business by including a sheet metal works for the manufacture of sheet metal building materials. This department will be in charge of W. H. Stacey, who for the past six years was superintendent of a like department for McFarlane-Douglas Co., Ottawa, Ont.

The Hanover Portland Cement Co., Hanover, Ont., contemplates remodeling its plant and installing additional equipment.

Plans are in progress for the erection of a factory at London, Ont., for the Republic Motor Co., Alma, Mich., to cost $500,000. A. C. Smith, 1502 Royal Bank Building, Toronto, is general manager for Canada.

The Pressed Metals Co., Ltd., 112 Adelaide Street East, Toronto, will erect a manufacturing plant at Sarnia, Ont.

The Volta Mfg. Co., Ltd., Welland, Ont., has been incorporated with a capital stock of $100,000 by Robert T. Turnbull, John Young, both of Welland; Charles W. Sim, St. Catharines, Ont., and others to manufacture castings and machinery and to smelt ferrous and non-ferrous metals, etc.

Bids will be received until July 29 for building a 150-ton pulp and paper mill at Donacona, Que., and a power plant with equipment to develop 5000 hp. on the Jacques Cartier River. Plans and specifications can be had upon application to "Pulp and Paper," Room 40, Toronto Stock Exchange Building, Toronto.

The Lang Mfg. Co., Ltd., Guelph, Ont., has been incorporated with a capital stock of $40,000 by Charles L. Dunbar, Leo W. Goetz, John Sutherland and others to manufacture machinery, tools, etc.

The National Standard Co. of Canada, Ltd., Guelph, Ont., has been incorporated with a capital stock of $30,000 by Charles H. C. Leggott, 116 Arundel Avenue; Walter W. Perry, Scarboro Junction, Ont., and others of Toronto, to manufacture wire, wire nails, cables, lightning rods, machinery, tools, etc.

The Pacific Coast

SAN FRANCISCO, July 1.

Business in general in this section is lagging. A number of important enterprises are ready for launching, but there is a hesitation about taking the initial step. The most active demand for machine tools still comes from automobile repair shops.

Bids have been called for furnishing and installing one 80-ton, four 15-ton and two 5-ton bridge cranes, together with 14 5-ton and six 3-ton wall cranes in the new structural shop at the Mare Island Navy Yard. The estimated cost is $250,000.

The Goodyear Tire & Rubber Co., Akron, Ohio, has acquired about 600 acres at Ascot Park, near Los Angeles, as a site for the erection of a new plant for the manufacture of automobile tires. A California corporation of the same name will be organized with a capital stock of $20,000,000 to build and operate the new works which will consist of a group of buildings to include every department of operation, as well as an electric power station. With machinery and equipment it is estimated to cost about $4,000,000. In association with this organization, the Pacific Cotton Mills, capitalized at $6,000,000, will build another factory group on an adjoining site for the manufacture of fabric for tire production. This latter plant, with equipment is estimated to cost about $1,500,000. The entire property will be laid out as a new industrial city and the works will give employment to about 3700 for initial operations. Plans for the projects will be placed under way at an early date.

The American Engine & Airplane Co., 2869 West Pico Street, Los Angeles, has filed notice of organization to manufacture airplane motors, parts, etc. Ralph Burdick, 1855 North Kingsley Drive, heads the company.

The Monarch Carburetor Lock Co., Los Angeles, has been incorporated with a capital of $100,000 by Samuel M. and Benjamin M. Bancroft, and Frank E. Greth, to manufacture carbureters, etc.

Contract has been awarded to M. N. Yesberg, 1650 Morton Avenue, Los Angeles, by the Seymore Co., for the erection of a new one-story, brick machine shop, 60 x 160 ft., on Figueroa Street, near Twelfth Street, to cost about $7,800.

Considerable machinery and equipment, including conveying and handling apparatus, shafting, electric motors,

... will be installed in the new packing plant to be erected at Vernon, Cal., by the California Provision Co., Los Angeles. The works will consist of a number of buildings, including a one-story boiler plant. The main packing plant with refrigerating department will be 88 x 142 ft.; a 25-ton refrigerating plant, with auxiliary equipment, will be installed. The entire cost is estimated at about $125,000, of which $75,000 will be expended for the machinery. The building contract has been let to Charles B. Harp, 1102 Baker-Detwiler Building, Los Angeles.

The Guaranteed Battery Equipment Co., Los Angeles, has been incorporated with a capital of $25,000 by T. S. Juden, C. E. Corson and T. O. Osborn, to manufacture batteries and other electrical equipment.

The Holton Power Co., Holtville, Cal., is planning for the installation of new electric equipment, including generating apparatus and auxiliary operating equipment, to develop a capacity of about 1000 hp. The new installation is estimated to cost about $75,000.

The Draper Engine Co., Seattle, contemplates the construction of an addition to its plant.

The loss sustained in the recent fire at the Standard Box & Lumber Co.'s sawmill at Scofield, Ore., has been placed at $225,000. The company is formulating plans for rebuilding.

An arrangement has been effected by which the Vulcan Mfg. Co., Seattle, will manufacture cranes for the Colby Steel & Engineering Co., Seattle, which holds large orders for cranes for use in Northwest shipyards and lumber mills. The Colby company recently took over the West Coast Steel Co. and the Auto Marine Engine Works, both of Tacoma.

The C. A. Smith Mill, Marshfield, Ore., will be put in operation and the power plant completely rebuilt. The Mountain States Power Co. will repair the power plant which will cost about $30,000, including the installation of new boilers and repairing old ones.

The West Coast Rubber Co., Seattle, will build a one-story factory, 112 x 153 ft., to cost $26,000. New equipment will be installed. J. W. Johnson is the owner.

NEW TRADE PUBLICATIONS

Steam Jet Ash Conveyor.—United Stokers Corporation, Old Colony Building, Chicago. Bulletin 100. Concerned with a steam jet ash conveyor system which consists primarily of a line of pipe leading from the ash pits to the point of ash disposal, with suitable ash intake fittings, installed at proper points in the line.

Heat Insulating Cements.—Celite Products Co., 11 Broadway, New York. Bulletin B-13. Describes an insulating cement for use on boiler drums, evaporators, vulcanizers, storage tanks, flues, breechings and other heated surfaces.

Apron Conveyors.—Jeffrey Mfg. Co., Columbus, Ohio. Catalog 258, 72 pages, 8½ x 11 in. Illustrations and descriptions with specifications of a line of apron conveyors of wood and steel types. Applications portrayed show the use of the conveyor with barrels, boxes, bags, coke, coal, refuse, etc.

Calendar.—Wagner Electric Mfg. Co., St. Louis. Size 13 x 23 in. Shows a farm scene with an electric motor driving a threshing outfit. A young boy in farm attire is prominent in the foreground. There are three calendar pads, showing the current, past and following months.

Rubber Working Machinery.—Allen Machine Co., Erie, Pa. Catalog B., 62 pages, 12 x 9 in. Concerned with a line of rubber mill machinery. Vulcanizing equipment, inner tube equipment, tubers and strainers, mills and calenders, hydraulic presses and reduction gears are included. The left page pictures the machine, the facing page describes it.

Preheater for Heat-Treatment Furnaces.—Syracuse Industrial Gas Co., 206 McCarthy Building, Syracuse, N. Y. Bulletin 4. Drawings and a description of a preheater for heating the air supplied to heat-treatment furnaces by using the hot gas leaving the furnace. Preheaters are made in different designs for use with different furnaces and fuels.

Gravity Conveyors.—Standard Conveyor Co., North St. Paul, Minn. Booklet. Concerned with gravity spiral chutes and roller conveyors, also a motor-driven slat conveyor. Numerous commercial applications are shown.

Pumping Units.—Allis-Chalmers Mfg. Co. Bulletin. A stock list of centrifugal pumping units.

Steam Jet Ash Conveyor.—James A. Brady Foundry Co., Forty-fifth Street and Western Boulevard, Chicago. Bulletin 3. Describes the company's steam jet ash conveyor system which conveys the ashes by suction created by passing large volumes of air at high velocity through a pipe, the velocity being obtained by the use of one or more steam jets. The various parts of the apparatus are illustrated and numerous commercial installations are shown.

Iron Gratings.—Irving Iron Works Co., Long Island City, N. Y. Catalog 2A. Describes Irving subway, which consists of a series of light steel bars placed on edge, between each pair of which a reticuline bar is placed and firmly riveted in position. The subway is made in two types with open mesh and close mesh for architectural, industrial and marine purposes. A number of industrial installations are shown.

Milling Machines.—Ingersoll Milling Machine Co., Rockford, Ill. Folder. Pictures an inclined rail milling machine channelling two locomotive main rods, an adjustable rail three-head milling machine milling heavy pump castings, and a fixed rail multiple spindle milling machine milling Liberty motor crank cases.

Welding Locomotive Fireboxes.—Air Reduction Sales Co., New York. Booklet 4. Describes the company's process of oxy-acetylene welding applied to locomotive fireboxes. The booklet is designed to help the operator by showing the proper methods to follow. Drawings illustrate the different operations.

Milling Machines.—Kearney & Trecker Co., Milwaukee. Catalog 21, 86 pages, size 9 x 6 in. Concerned with a line of horizontal and vertical milling machines with constant speed drive. Numerous views of assembled milling machines, also various parts and attachments are shown.

Tool and Alloy Steels.—Hammond Steel Co., Syracuse, N. Y. Catalog 20. Devoted to a line of tool steels of different grades; alloy steels including chrome bearing, nickel, chrome nickel, chrome vanadium and spring steels; also electric die block steels. Valuable information on the treatment of steels is included.

Tool Holders.—J. H. Williams & Co., Brooklyn, N. Y. Booklet. Illustrations and descriptions of a line of tool holders, including those for turning, cutting-off, boring, knurling, threading and planing tools. Lathe dogs, clamps, external caliper gages, internal caliper gages, etc., are included.

Single-Phase Motors.—Wagner Electric Mfg. Co., St. Louis. Bulletin 118. Features and describes single-phase motors, including those that operate on the split phase principle and those operating on the so-called repulsion starting, induction running principle, also vertical motors.

Rope and Cable.—Waterbury Co., 63 Park Row, New York. Catalog with stiff cover, 217 pages, 3½ x 6 in. Descriptions, specifications and illustrations of the company's output of wire rope, armored rope, fibre-clad rope, music wire, Manila rope, Sisal rope, and drilling cables.

Standard Factory Buildings.—Austin Co., Cleveland. Catalog, with the title "The Austin Method," 64 pages, 11 x 8½ in. An explanation of the Austin method of factory construction, including engineering data, illustrations and descriptions of 10 types of standard factory buildings. A presentation of the company's building service for the design, construction and equipment of factories and power-plants is included.

Engineering and Construction Service.—Westinghouse Church Kerr & Co., 37 Wall Street, New York. Folder. Shows views of industrial plants, power plants, railroad shops, terminals, etc., that the company has designed and built.

Automatic Ink-Wells.—Lewis Ball Bearing Ink-well Co., Corry, Pa. Catalog. Pictures and describes a line of ink-wells which are self corking by the action of a single or double ball bearing which floats in the ink. Containers for mucilage are also described.

Fuel Oil.—Tide Water Oil Co., 11 Broadway, New York. Booklet, 45 pages, size 6 x 9 in. Concerned with fuel oil, its uses, economy, efficiency and the apparatus necessary for its use, with charts, diagrams and numerous illustrations.

Presses for Sheet and Bar Metals.—Ferracute Machine Co., Bridgeton, N. J. Catalog 21, 132 pages, 6 x 9 in., stiff cover. Devoted to the company's output of various types of cutting and forming presses, drawing and redrawing presses, embossing presses, foot and hand presses, gravity presses, punching and shearing presses, stamping and bending presses, spinning lathes, special mine machinery, petroleum can machinery, sheet metal tools and dies. The various machines are illustrated and views are shown of press rooms of some of the company's customers.

Bronze Products for Engineering Purposes.—American Manganese Bronze Co., Holmesburg, Pa. Catalog. Explains the characteristics and gives the principal properties of the company's line of bronzes. Descriptions and illustrations of castings that the company has produced include hydraulic castings, centrifugal pump castings, turbine runners, valves and valve stems, worms and worm gears, bridge bearings, propellers, etc.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price	6.10c
Burden's best bar iron, base price	6.30c
Swedish bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.37c
1 to 6 in. x ⅜ to 1 in	3.37c
1 to 6 in. x ¼ and 5/16	3.47c
Rods—⅝ and 11/16	3.42c
Bands—1½ to 6 x 3/16 to No. 8	4.07c
Shapes:	
Beams and channels—3 to 15 in	3.47c
Angles:	
3 in. x ¼ in. and larger	3.47c
3 in. x 3/16 and ⅛ in	3.72c
1½ to 2½ in. x ⅛ in	3.52c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in	3.52c
1 to 1¼ in. x ⅛ in	3.57c
⅞ x ⅞ x ⅛ in	3.62c
¾ x ⅛ in	3.67c
⅝ x ⅛ in	4.47c
½ x 3/32 in	5.17c
Tees:	
1 x ⅛ in	3.87c
1¼ in. x 1¼ x 3/16 in	3.77c
1½ to 2½ x ¼ in	3.57c
1½ to 2½ x 3/16 in	3.57c
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ⅜ in. and larger	4.00c
Open-hearth spring steel	6.00c
Standard cast steel, base price	14.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.17c	——
Nos. 22 and 24	5.22c	6.55c
No. 26	5.27c	6.60c
No. 28	5.37c	6.75c
No. 30	5.57c	——

No. 28, 36 in. wide, 10c higher.

Wood's Keystone Hammered, 18-24 gage, 9¾c; 26-28 gage, 10¼c.

Galvanized

	Per lb.
No. 14	5.80c
No. 16	5.95c
Nos. 18 and 20	6.10c
Nos. 22 and 24	6.25c
No. 26	6.40c
No. 27	6.55c
No. 28	6.70c
No. 30	7.20c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per lb.
Bright basic	5.25c
Annealed soft	5.25c
Galvanized annealed	6.00c
Coppered basic	6.00c
Tinned soft bessemer	7.25c

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	23c to 24¾c
High Brass Wire	23c to 24¾c
Brass Rod	21½c to 23c
Brass Tube	33¾c to 38c

Copper Sheets

Sheet copper, hot rolled, 16 oz., 27½c. to 30c. per lb. base.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb.	$8.30	$8.05
		90 lb.	8.40	8.15
		100 lb.	8.55	8.30
IC $11.30	$10.05	IC	8.80	8.55
IX 13.50	12.00	IX	10.00	9.75
IXX 15.25	13.75	IXX	10.95	10.70
IXXX 17.00	15.50	IXXX	11.90	11.65
IXXXX 18.75	17.25	IXXXX	12.85	12.60

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.50
IC	8.65
IX	9.65
Fire door stock	11.50

Tin

Straits pig	74c to 75c
Bar	80c to 85c
American pig, 99 per cent	70c to 72c

Copper

Lake Ingot	18c to 19c
Electrolytic	17½c to 18½c
Casting	17c to 18c

Spelter and Sheet Zinc

Western spelter	8½c to 9c
Sheet zinc, No. 9 base, casks	12c; open 13c

Lead and Solder*

American pig lead	6c to 6½c
Bar lead	7½c to 8½c
Solder ½ & ½ guaranteed	45c
No. 1 solder	40c
Refined solder	34c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c
Commercial grade, per lb	50c

Antimony

Asiatic	9½c

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 37c to 39c

Old Metals

The market is firm. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	16.50
Copper, heavy and wire	15.25
Copper, light and bottoms	13.25
Brass, heavy	9.75
Brass, light	7.75
Heavy machine composition	15.50
No. 1 yellow rod brass turnings	8.75
No. 1 red brass or composition turnings	12.75
Lead, heavy	4.62½
Lead, tea	3.75
Zinc	4.25